

NOTICE

All drawings located at the end of the document.

QUARTERLY UPDATE

FOR JANUARY 1, 1994 THROUGH
MARCH 31, 1994

HISTORICAL RELEASE REPORT (HRR)

PREPARED BY

**ENVIRONMENTAL RESTORATION
FACILITIES OPERATIONS MANAGEMENT**

EG&G ROCKY FLATS, INC.

APRIL 1994

SW-A-002622

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TABLE OF CONTENTS

DESCRIPTION	Page
1.0 Introduction	4
2.0 New PAC Narratives	10
PAC Reference Number NE-1410	11
(Diesel Fuel Spill at Field Treatability Unit, OU 2)	
PAC Reference Number NE-1411	13
(Diesel Fuel Overflow from Tanker, OU 2)	
PAC Reference Number NW-1503	15
(Improper Disposal of Diesel-Contaminated Material at Landfill)	
PAC Reference Number NW-1504	17
(Improper Disposal of Thorosilane-Contaminated Material at Landfill)	
PAC Reference Number 000-503	19
(Solar Pond Water Spill Along Central Avenue)	
PAC Reference Number 300-711	22
(Ni-Cad Battery Spill Outside of Building 373)	
PAC Reference Number 300-712	24
(Antifreeze Spill North of Building 373)	
PAC Reference Number 400-813	26
(RCRA Tank Leak in Building 460)	
PAC Reference Number 600-1005	29
(Former Pesticide Storage Area)	
PAC Reference Number 900-1311	31
(Septic Tank East of Building 991)	

PAC Reference Number 900-1312 (OU 2 Water Spill)	35
3.0 Revised PAC Narratives	61
3.1 Response to Agency Comments on Sixth Quarterly Update	63
3.2 Revised Quarterly Updates Reflecting Revised PAC Identification Numbers	70
4.0 Updated IHSS and PAC MAPs	90

1.0 INTRODUCTION

This Seventh Quarterly Update to the Historical Release Report (HRR) provides a variety of information pertaining to spills and releases of contaminants at RFP. This information includes:

- releases to the environment identified during January 1, 1994, to March 31, 1994;
- narratives for PACs from the First Quarterly Update which were not originally described in narrative form;
- a cumulative table of all PACs identified since the June 1992 HRR;
- responses to EPA comments on the Sixth Quarterly Update;
- revised PAC narratives for those PACs with numbering changes;
- an up-to-date IHSS map; and
- an up-to-date PAC map.

In addition, this quarterly update incorporates several content changes based on the March 31, 1994 meeting with representatives from CDH, EPA, DOE and EG&G. These changes include a line in each write-up used to cross-reference RCRA Contingency Plan Implementation Reports (CPIRs) and an Action/No-Action section to identify recommended actions at each PAC. Finally, an agency concurrence form is located on page 9 of this introduction to allow agency representatives to confirm their review of the quarterly update and provide the opportunity for agency comments and/or concurrence with this quarterly submittal.

Table 1 provides a list of all PACs identified since the June 1992 HRR. It also provides a cross-reference for the OU in which the spill occurred, IHSS numbers for spills occurring within an IHSS, a CPIR cross-reference number and the number of the quarterly update in which the PAC was originally identified. Narrative descriptions of PACs identified in the First and Seventh Quarterly Updates are included in this document. The First Quarterly Update did not provide narrative PAC descriptions in the HRR format; therefore, the PACs from the First Quarterly Update are included as new PACs in Section 2.0 of this report.

Section 3 provides updated copies of PACs which have been revised since their original submittal. Section 3.1, includes responses to Agency Comments on the Sixth Quarterly Update with an updated copy of PAC narrative descriptions if necessary. A summary of responses to agency comments is contained on page 8 of this introduction. Section 3.2 provides clean copies of PACs which have undergone numbering changes since their original submittal. Table 1 also identifies those PACs which were originally identified with a different PAC number.

Up-to-date copies of IHSS and PAC maps are included in Section 4.0. The IHSS map reflects the most current boundaries of IHSSs based on work to date at the various operable units. The PAC map includes all PACs identified to date, as well as under building contamination (UBC) sites. Up-to-date maps will continue to be issued with each quarterly report.

TABLE 1
NEW PACS IDENTIFIED IN QUARTERLY UPDATES

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
142.6	6	NA	NE-1404	Diesel Spill at Pond B-2 Spillway	2
NA	2	NA	NE-1405	Diesel Fuel Spill at Field Treatability Unit (<i>formerly NE- 1404</i>)	3
NA	4	NA	NE-1406	771 Hillside Sludge Release	4
NA	2	93-002	NE-1407	OU 2 Treatment Facility	4
NA	2	93-005	NE-1408	OU 2 Test Well (<i>formerly NE- 1406</i>)	4
NA	4	93-007	NE-1409	Modular Tanks and 910 Treatment System Spill (<i>formerly 000-503</i>)	5
NA	2	NA	NE-1410	Diesel Fuel Spill at Field Treatability Unit	7
NA	2	NA	NE-1411	Diesel Fuel Overflowed from Tanker at OU 2 Field Treatability Unit	7
NA	10	NA	NW-1500	Diesel Spill at PU&D Yard (<i>formerly NW-175</i>)	2
NA	10	NA	NW-1501	Asbestos Release at PU&D Yard (<i>formerly NW-176</i>)	2
114	7	92-021	NW-1502	Improper Disposal of Diesel Contaminated Material at Landfill (<i>formerly NW-177</i>)	2
114	7	92-004	NW-1503	Improper Disposal of Fuel Contaminated Material at Landfill	1
114	7	94-002	NW-1504	Improper Disposal of Thorosilane Contaminated Material at Landfill	7

TABLE 1 (Continued)
NEW PACS IDENTIFIED IN QUARTERLY UPDATES

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
NA	NA	94-005	000-503	Solar Pond Water Spill Along Central Avenue	7
NA	NA	93-003	100-613	Asphalt Surface in Lay Down Yard North of Building 130 <i>(formerly identified as 000-501)</i>	4
NA	NA	93-003	300-711	Ni-Cad Battery Spill Outside of Building 373	1
NA	NA	92-002	300-712	1/2 gal Antifreeze Spilled by Street Sweeper Outside of Building 373	1
NA	NA	NA	400-811	Transformer 443-2, Building 443	2
NA	NA	93-009	400-812	Tank T-2 Spill in Building 460	6
NA	NA	94-001	400-813	RCRA Tank Leak in Building 460	7
NA	NA	93-004	500-906	Asphalt Surface Near Building 559	4
152, 157.1, 172	12	NA	600-1004	Central Avenue Ditch Cleaning Incident <i>(formerly identified as 400-820)</i>	6
NA	NA	NA	600-1005	Former Pesticide Storage Area	7

TABLE 1 (Continued)
NEW PACS IDENTIFIED IN QUARTERLY UPDATES

IHSS ¹	OU ¹	CPIR Cross- Reference ²	PAC	PAC NAME ³	Original Quarterly Update #
NA	NA	92-005	800-1212	Building 866 Sump Spill	5
NA	NA	NA	900-1308	Gasoline Spill Outside of Building 980	6
NA	2	93-010	900-1309	OU 2 Field Treatability Unit Spill	6
NA	NA	92-023	900-1310	ITS Water Spill (formerly identified as 000-502)	2
NA	NA	NA	900-1311	Septic Tank East of Building 991	7
NA	2	94-004	900-1312	OU-2 Water Spill	7

¹NA = Not applicable. Not all PACs are located in Individual Hazardous Substance Sites (IHSSs) or Operable Units (OUs). Likewise, not all PACs are identified in RCRA Contingency Plan Implementation Reports (CPIRs).

²RCRA Contingency Plan Implementation Reports (CPIRs) identified during the Seventh Quarter included CPIR 94-001 through 94-005. All of these involved releases to the environment and are identified as PACs except CPIR 94-003, which was a release confined to secondary containment.

³Several PAC numbers have been revised to reflect a more accurate location on the PAC map. Former PAC numbers are identified in parentheses within italics.

RESPONSE TO AGENCY COMMENTS ON THE SIXTH QUARTERLY UPDATE TO THE HISTORICAL RELEASE REPORT

Comment: For PAC 400-812, samples of the spilled liquid and affected soils were analyzed and the quarterly report stated that the analytical results of these samples were used to determine that the soils were not hazardous. These analytical results must be provided to EPA to substantiate this determination.

Response: The validated analytical data for these samples will be provided to CDH and EPA as soon as they become available.

Comment: For PAC 900-1309, samples were taken of the collected water on December 3 and December 8, 1993, the analytical results of which must be submitted to EPA.

Response: The validated analytical data for the water samples are not yet available. These data will be submitted as soon as they become available.

Comment: For PAC 400-820, a revision to the OU 13 Technical Memorandum No. 1 must specifically include at least one surficial soil sample of the sediments deposited in IHSS 152 that were taken from the Central Avenue ditch. In addition, on a recently submitted map of HPGe survey result, an elevated Americium level was shown to be present at location 5B-13 which is in both IHSS 157.1 and 152. Statements in the quarterly update must be reviewed with respect to radiological contamination and the location of the sediment removal from the Central Avenue Ditch. Also, since RFP coordinates were used for this release location instead of State Plane coordinate, it could not be easily plotted on the HPGe survey map.

Response: The radiological findings from High Purity Germanium (HPGe) detectors will be addressed in a future HRR quarterly report. The reporting of HPGe results is inappropriate at this time because HPGe field results are being confirmed by laboratory analysis. Interference in field HPGe results is possible due to nearby buildings containing radionuclides, and there is uncertainty over the exact coordinates where HPGe field results were obtained. The radiological implications of these HPGe results will be incorporated into a future HRR update once these issues are addressed.

In the current Seventh Quarterly Update, this PAC has been renumbered to more accurately reflect its map location. Its new number is PAC 600-1004. The response identified above is noted in the "Comments" section of the PAC narrative.

Other General Responses to Comments

Maps for IHSSs and PACs are included in the Seventh Quarterly Update.

Contingency Plan Implementation Reports (CPIRs) have not been included in the Quarterly Update submittal; however, they are referenced in the narratives and identified in a cross-reference table.

HRR QUARTERLY UPDATE AGENCY ACCEPTANCE FORM

HRR QUARTERLY UPDATE 7

The recommendations of the Department of Energy (DOE) with regard to the need for future actions, or the lack of the need for future actions, are included in each PAC narrative description included in this quarterly update. Any PACs for which a decision is deferred will be addressed in future HRR quarterly updates.

Please note any exceptions to the recommended actions below or attach comments to this form as needed:

Please provide comments or acceptance within two weeks from receipt of quarterly update submittal.

DOE Signature	CDH Signature	EPA Signature
	<input type="checkbox"/> CDH agrees with recommendations <input type="checkbox"/> CDH disagrees with recommendations; see comments	<input type="checkbox"/> EPA agrees with recommendations <input type="checkbox"/> EPA disagrees with recommendations; see comments
DOE Signature and Position	CDH Signature and Position	EPA Signature and Position

SECTION 2.0
NEW PAC NARRATIVES

**(PACS IDENTIFIED DURING JANUARY 1, 1994, THROUGH MARCH 31, 1994
AND
PACS IDENTIFIED DURING THE FIRST QUARTERLY UPDATE TO THE HRR)**

 **EG&G ROCKY FLATS**

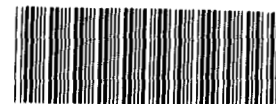
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April 29, 1994

94-RF-04917



000028784

J. M. Roberson
Acting Assistant Manager for
Environmental Restoration
DOE, RFFO

Attn: N. I. Castaneda

SUBMITTAL OF SEVENTH QUARTERLY UPDATE TO THE HISTORICAL RELEASE REPORT (HRR)
- SGS-277-94

Enclosed is the seventh Quarterly Update Report to the Historical Release Report (HRR) for January 1, 1994 through March 31, 1994. We are submitting four copies (two each) of this update report for transmittal to the Environmental Protection Agency and the Colorado Department of Health and one additional copy for your files.

This report is being submitted in accordance with the EG&G Rocky Flats, Inc. Interagency Agreement, Sections I.B.3 Notification and I.B.5 Historical Release Report.

If you have any questions regarding this transmittal, please contact Nick Demos of my staff extension 6938 or digital page 3842.



S.G. Stiger
Associate General Manager
Environmental Restoration Management

NSD:la

Orig. and 1 cc - J. M. Roberson

Enclosure:
As Stated

CC:
M. H. McBride - DOE, RFFO
M. N. Silverman - " "
L. W. Smith - " "



DIST.	LTR	ENC
AMARAL, M.E.		
BERMAN, H.S.		
BRANCH, O.B.		
CARNIVAL, G.J.		
COPP, R.D.		
DAVIS, J.G.		
FERREIRA, D.W.		
HANNI, B.J.		
HARMAN, L. K.		
HEALY, T.J.		
HEDAH, T.		
HILBIG, J.G.		
HUTCHINGS, N.M.		
KELL, R.E.		
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MAHAFFEY, J.W.		
MANN, H.P.	X	
MARX, G.E.		
MCDONALD, M.M.		
McKENNA, F.G.		
MONTROSE, J.K.		
MORGAN, R.V.		
POTTER, G.L.		
PIZZUTO, V.M.		
RISING, T.L.		
SANDLIN, N.B.		
SETLOCK, G.H.		
STEWART, D.L.		
STIGER, S.G.	X	
SULLIVAN, M.T.		
SWANSON, E.R.		
WILKINSON, R.B.	X	
WILSON, J. M.		
WYANT, R.D.		
Johnston, L.	X	
Demos, N.S.	X	

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CLASSIFICATION OFFICE

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IN REPLY TO RFP CC NO:

ACTION ITEM STATUS

☐ PARTIAL/OPEN☐ CLOSED

LTR APPROVALS:

ORIG & TYPIST INITIALS

M.C.B.

R.D. LA

PAC REFERENCE NUMBER: NE-1410

IHSS Number: NA

Unit Name: Diesel Fuel Spill at Field Treatability Unit, OU 2

CPIR No.: NA

Approx. Location: N750,008; E2,087,290

Date(s) of Operation or Occurrence:

October 10-11, 1993

Description of Operation or Occurrence

On October 10, RFP Garage personnel were refueling an emergency generator unit with diesel fuel at OU 2. The operator turned his back on the operation to shield himself from wind, and when he turned back around, the automatic nozzle valve had not automatically turned off as expected, resulting in approximately 0.5 to 1 gallons of fuel spilling inside the generator unit.¹

On October 11, 1993 at 9:30 a.m., the generator was being filled again. The OU 2 project manager was conducting a shift inspection at this time and noticed a shiny pool of 2 to 3 gallons of a substance on the ground on the north side of the generator.¹

Physical/Chemical Description of Constituents Released

The first spill involved approximately 0.5 to 1.0 gallons of diesel fuel released to an area within the generator unit. The second spill involved 2 to 3 gallons of diesel fuel released to the soil.¹

Responses to Operation or Occurrence

The October 10 spill was absorbed with Oil-Dri™. For the October 11 spill, the Haz-Mat team responded by applying Oil-Dri™ to the standing liquid. Because the soil around the area was very compacted, a backhoe was used to loosen the soil. The affected soil was removed and placed in six 55-gallon grey drums and held by the garage. Soil samples were taken from the soil and the bermed area. The Waste Identification and Characteristic Organization determined the sample to be non-hazardous based on previous sample results. The analysis was below regulatory limits for benzene.¹

Fate of Constituents Released to Environment

The soil affected by the 2 to 3 gallon diesel spill was removed. The area affected was approximately 200 square feet. The spill was not located in an IHSS.¹

Action/No-Action Recommendation

Based on the removal of the affected soil and the relatively small quantity of diesel fuel spilled (less than 5 gallons), no further action is recommended at this site.

Comments

A similar diesel spill occurred on January 14, 1993 and is documented in PAC NE-1405.

References

¹EG&G, 1993. Critique Meeting Minutes. Occurrence Tracking Number RFO--EGGR-ENVOPS-1993-0018, October 12, 1993.

PAC REFERENCE NUMBER: NE-1411

IHSS Number: NA

Unit Name: Diesel Fuel Spill at Field Treatability Unit, OU 2

CPIR: NA

Approx. Location: N749,988; E2,087,265

Date(s) of Operation or Occurrence:

January 29, 1994

Description of Operation or Occurrence

As garage employees were refueling a diesel generator located near OU 2, approximately 20 gallons of diesel fuel were released to the ground. The incident occurred during the transfer of fuel from the generator (tank B to tank A). The multi-tank fueling process is necessary due to limited space near the generator. The generator is initially refueled from Tank A, which in turn is refueled through a hose from Tank B. Due to extreme cold, the employees attending the refueling operation were sitting in the truck cab and were not able to hear a problem over the generator noise. When they smelled diesel fumes, they immediately cut the master switch from inside the cab and notified the Shift Supervisor of the spill. It was determined that the backfeed preventer tube on the pump nozzle froze, causing the automatic shut-off to malfunction, releasing approximately 20 gallons of diesel fuel to the ground. Although the generator itself is located within secondary containment, the spill area was not within the containment and diesel was released to the soil.¹

Physical/Chemical Description of Constituents Released

Approximately 20 gallons of diesel fuel were released to the soil.¹

Responses to Operation or Occurrence

The employees immediately notified the Shift Superintendent who in turn notified the EG&G Fire Department Haz-Mat team who responded and contained the leak. EG&G's Waste Regulatory Programs (WRP) were notified and determined that the spill was non-hazardous based upon recent soil characterization. Labor and Haz-Mat personnel removed the soil and placed it in barrels per WRP and Operations requirements.¹

Fate of Constituents Released to Environment

The affected soil was removed from the area.¹

Action/No-Action Recommendation

No further action is recommended based on removal of the affected soil.

Comments

None.

References

¹EG&G, 1994. Critique Minute Meetings re: Generator Refueling Spill. January 31, 1994.

PAC REFERENCE NUMBER: NW-1503

IHSS Number: 114

Unit Name: Improper Disposal of Fuel-Contaminated Material at Landfill

CPIR: 92-004

Approx. Location: N752,668; E2,083,573

Date(s) of Operation or Occurrence:

February 26, 1992

Description of Operation or Occurrence

On February 26, 1992, empty motor oil containers, used oil filters and oil-stained debris were inadvertently disposed of in the present landfill.¹

Physical/Chemical Description of Constituents Released

The used oil filters are regulated as RCRA hazardous waste due to lead levels at 99 ppm, which exceed the Toxicity Characteristic Leaching Procedure (TCLP) limit of 5 ppm.¹

Responses to Operation or Occurrence

The materials of concern were immediately recovered and drummed by landfill personnel. The RCRA Contingency Plan was implemented and a determination was made that due to the prompt recovery of the material, no actual or potential threat to the environment or human health was posed.¹

Fate of Constituents Released to Environment

The materials were recovered; therefore, they are no longer present in the landfill and do not pose a threat to the environment.¹

Action/No-Action Recommendation

No further action is recommended based on recovery of the materials from the landfill.

Comments

This CPIR was identified in the First Quarterly Update of the HRR, but no formal PAC narrative was ever written; therefore, it is being included with this Seventh Quarterly Update.

References

¹RCRA Contingency Plan Implementation Report 92-004. February 10, 1992.

PAC REFERENCE NUMBER: NW-1504

IHSS Number: 114

Unit Name: Improper Disposal of Thorosilane-Contaminated Material at Landfill

CPIR: 94-002

Approx. Location: N752,613; E2,083,537

Date(s) of Operation or Occurrence:

January 28, 1994

Description of Operation or Occurrence

On January 28, 1994, materials potentially contaminated with Thorosilane were disposed of in the sanitary landfill.¹

This incident occurred as a result of a January 27, 1994 spill in Building 551 when a 5-gallon bucket containing approximately 5 gallons of Thorosilane product leaked into the double bags surrounding the can. Thorosilane is an ignitable liquid which was stored in the Building 551 Warehouse Flammable Storage Vault #4. The material released into the surrounding bags was cleaned up by a warehouse employee. The employee had been given proper disposal instructions by the Environmental Coordinator (EC) to dispose of the spilled material, but misunderstood the cleanup procedure. As a result, the spill was cleaned up by placing the bucket containing the un-spilled Thorosilane and the bags containing the released Thorosilane in a 20-gallon poly-pack drum and adding 75-pounds of Oil-Dri™ to the top without properly agitating the drum contents. The drum was then sealed and placed in a dumpster. The contents of the dumpster were transferred to the trash truck and subsequently placed into the sanitary landfill.¹

Physical/Chemical Description of Constituents Released

When disposed of in liquid form, Thorosilane is considered a hazardous waste exhibiting the characteristic of ignitability (D001). Thorosilane consists of mineral spirits, naptha and diacetone alcohol.¹

Responses to Operation or Occurrence

On the afternoon of January 28, two ECs went to the Warehouse to follow-up the incident in Building 551 and to discuss the usability of the contents remaining in the five-gallon bucket. Upon arrival, they discovered that improper procedures had been followed and that both the spilled material and the bucket of the residual unspilled Thorosilane had been sent to the landfill.

Upon further investigation on January 31, it was determined that because of the addition of Oil-Dri™ to the drum without proper agitation, it was possible that free liquids could have leaked

from the drum into the trash in the truck. The RCRA Contingency Plan was implemented as a precautionary measure because Thorosilane, when disposed of in liquid form, is considered a hazardous waste.¹

On February 1, 1994, the poly-pack was located in the landfill; however, the lids and approximately half of the waste were not found. It was presumed that the hydraulic compaction system in the trash truck crushed both the overpack and metal bucket and that the lids from both containers were dislodged as a result of being crushed. Thus, the contents of the overpack could have been commingled with the trash in the truck prior to placement in the landfill. The crushed poly-pack and product bucket containing part of the Oil-Dri™ were packaged in a 55-gallon drum and returned to the warehouse for proper handling and disposition.¹

Fate of Constituents Released to Environment

Based on the removal of the crushed poly-pack, product bucket and approximately 50 pounds of the Oil-Dri™ and absorbed liquid, it is believed approximately one-half of the contaminated material was recovered from the landfill. Upon observation of the recovered containers, no free liquids were found to be present. Based on these observations, no evidence of RCRA-regulated ignitable hazardous waste material was present; however, approximately 50% of the material was not recovered.¹

The CPIR indicated that the incident had not contributed any measurable deterioration to the landfill condition prior to this incident.

Action/No-Action Recommendation

No further immediate action is recommended; however, the possible presence of Thorosilane-contaminated material in the sanitary landfill should be noted by the Project Manager of OU 7.

Comments

This PAC is located within the boundaries of PAC NW-114, the sanitary landfill, which is currently being addressed as part of OU 7.

References

¹RCRA Contingency Plan Implementation Report 94-002. February 9, 1994.

PAC REFERENCE NUMBER: 000-503

IHSS Number: NA

Unit Name: Solar Pond Water Spill Along Central Avenue

CPIR No.: 94-005

Approx. Location: N749,000; E2,084,000--Central Avenue from Portal 1 to Building 374 Feed Storage Tanks

Date(s) of Operation or Occurrence:

March 31, 1994

Description of Operation or Occurrence

Tanker truck #7 was transporting Solar Pond 207B water from the 750 Pad to the Building 374 feed storage tanks (Tanks 231A and 231B) with the top port of the tank inadvertently unlatched. When the truck stopped at a stop sign at Portal 1, the top port jarred open. During continued transport, the water sloshed out of the port onto the asphalt road surface for approximately 1-1/2 miles. An employee witnessed the spillage and followed the tanker to Building 374 and notified the trucker of the incident.¹

Physical/Chemical Description of Constituents Released

Approximately 35 gallons of the 207B Solar Evaporation Pond water spilled. As currently documented in the Waste Stream and Residue Identification and Characterization (WSRIC) manual for OU 4 operations, the EPA waste codes assigned to the Solar Evaporation Pond sludge and water include F001, F002, F003, F005, F006, F007, F009, and D006. The pH of the truck load involved was measured during the spill response and reported at a pH of 10.¹ A radiological survey of the truck and puddles on the roadway showed gross alpha at 1150 pCi/L, a value below background concentrations.² Analysis for selected metals was also performed on both the water in the truck and the recovered material, which was believed to be diluted with snow-melt. These preliminary data are contained in the following table with characterization data for the 207 A/B pond waste water for comparison.¹ When validated data become available, they will be submitted to CDH and EPA as a follow-up both in the Eighth Quarterly Update and in a RCRA CPIR Addendum.

Analytical Data For Solar Ponds Waste Water

Analyte	Highest Average Value for Pond Characterization Data ¹ (mg/L)	Preliminary/Un-validated Sweep Results for Tanker Truck Sample ² (mg/L)	Preliminary/Un-validated Sweep Results for Recovered Material Sample ² (mg/L)	TCLP Regulatory Limit (mg/L)
Arsenic	0.321	0.169B	0.089B	5.0
Barium	0.139	0.108B	0.220	100.0
Cadmium	0.003	0.060	0.011	1.0
Chromium	0.028	0.136	0.012	5.0
Lead	ND	ND	0.070B	5.0
Selenium	0.043	0.110B	0.077B	1.0
Silver	ND	ND	ND	5.0

ND = analyte not detected

B = analyte also detected in method blank

¹Characterization data from Pond Sludge and Clarifier Sludge Waste Characterization Report. The four impoundments were each sampled and an average concentration calculated (each average was usually based on five samples). The highest average is presented.

²Unvalidated data based on preliminary sweep analysis for samples collected on March 31, 1994. Quantities are estimated.

Responses to Operation or Occurrence

The driver notified the Shift Superintendent, who then notified the Haz-Mat team. The Haz-Mat team responded and cordoned off the affected area to prevent the spread of contamination. The RCRA Contingency Plan was implemented due to hazardous wastes documented in the Solar Pond water. Samples of the material in the truck were taken and analyzed for pH and gross alpha. Upon determination that radioactivity levels were below background, Liquid Waste Treatment personnel from Building 374 vacuumed a total of 55 gallons of free liquids from the roadway and placed them in a container. This liquid included snowmelt from puddles as well as spillage from the tanker. The recovered waste was transferred to the Building 374 treatment facility for treatment.¹

Fate of Constituents Released to Environment

The spill material appeared to have been fully contained on the asphalt road surface between the 750 pad and the 231 Tanks. Liquid material along the 1-1/2 mile of affected asphalt was

removed. No material was observed to have reached the soils; thus, no threat to the environment was identified.¹

Action/No-Action Recommendation

Based on the prompt cleanup of the spill and confinement of the spill to an asphalted area, no further action is recommended for this incident.

Comments

None.

References

¹RCRA Contingency Plan Implementation Report No. 94-005. April 12, 1994.

²PC ORPS Occurrence Report No. Temp-NR-001 #04651, Pond Water Released to Roadways from Tanker Truck. April 4, 1994.

PAC REFERENCE NUMBER: 300-711

IHSS Number: NA

Unit Name: Ni-Cad Battery Spill Outside of Building 373

CPIR No.: 92-002

Approx. Location: N750,751; E2,082,630

Date(s) of Operation or Occurrence:

January 30, 1992

Description of Operation or Occurrence

On January 29, 1992, maintenance personnel placed 20 used Ni-Cad rechargeable batteries in two wood boxes on a pallet outside of Building 373. During routine surveillance of the boxes on January 30, it was noted that one corner of the box and surrounding ground were wet due to the release of less than one quart of potassium hydroxide solution from the used batteries.¹

Physical/Chemical Description of Constituents Released

The material released consisted of potassium hydroxide, cadmium and cadmium hydroxide, nickel and nickel hydroxide, and lithium hydroxide. The measured pH range was 10 to 14. The solution likely contained cadmium in excess of the TCLP limit of 1 mg/L.¹

Responses to Operation or Occurrence

The Haz-Mat team responded to the release and identified low liquid levels in two of the batteries. One-third of the pallet, two wood boxes and approximately two feet of contaminated soil were collected in plastic bags and placed in drums, which were moved to a 90-day accumulation area. All of the batteries were triple-wrapped in plastic and put on a new pallet, which was also placed in a 90-day accumulation area. A RCRA Contingency Plan Implementation Report (92-002) was submitted to CDH.¹

Fate of Constituents Released to Environment

The contaminated wood, soil, and batteries were managed as RCRA hazardous waste and removed to the 90-day accumulation area. The CPIR indicated that there did not appear to be an actual or potential threat to human health or the environment.¹

Action/No-Action Recommendation

No further action is recommended based on the removal of the contaminated materials and prompt implementation of the RCRA Contingency Plan.

Comments

This release was listed in the First Quarterly Update to the HRR; however, no formal write-up was made at that time.

References

¹RCRA Contingency Plan Implementation Report 92-002. February 10, 1992.

PAC REFERENCE NUMBER: 300-712

IHSS Number: NA

Unit Name: Antifreeze Spill North of Building 373

CPIR No.: 91-031

Approx. Location: N750,872; E2,082,633

Date(s) of Operation or Occurrence:

October 25, 1992

Description of Operation or Occurrence

One-half gallon of antifreeze was spilled on the pavement north of Building 373 by a street sweeper.¹

Physical/Chemical Description of Constituents Released

The antifreeze consisted of approximately 50% ethylene glycol and 50% water.¹

Responses to Operation or Occurrence

The RCRA Contingency Plan was implemented and the spill was absorbed by absorbent material and packaged. A hazardous waste characterization was made which indicated that the material did not need to be managed as RCRA hazardous waste.¹

Fate of Constituents Released to Environment

No actual or potential threat to human health or the environment was believed to be posed by this spill.¹

Action/No-Action Recommendation

No further action is recommended based on the absorption and removal of the spill and on the determination that no actual or potential threat to human health or the environment was believed to have been posed by this spill.

Comments

This CPIR was cross-referenced as being included in the June 1992 HRR; however, upon further examination, it was determined that this spill had not actually been discussed in the HRR. Thus, it is being included in this update.

References

¹RCRA Contingency Plan Implementation Report 91-031. October, 1991.

PAC REFERENCE NUMBER: 400-813

IHSS Number: NA

Unit Name: RCRA Tank Leak in Building 460

CPIR No.: 94-001

Approx. Location: N748,760; E2,081,960

Date(s) of Operation or Occurrence:

January 12, 1994

Description of Operation or Occurrence

During a routine daily inspection, approximately 2 gallons of liquid was found in the secondary containment piping associated with a RCRA-regulated process aqueous waste collection tank (RCRA Unit 40.12) in Building 460.¹ The release originated from the gravity drain piping between a process sink and sump tank ST-2 (the ancillary equipment associated with the RCRA Unit). The affected piping is located under the concrete floor in Room 151 in the approximate center of Building 460. The secondary containment system for the affected area consists of a pipe within a pipe. The released liquid was determined to contain levels of cadmium and silver that make the material a characteristic hazardous waste.²

An engineering evaluation of the integrity of the secondary containment system was conducted to determine whether there may have been a pathway for contaminants to spread to the environment. Based on the results of the preliminary testing conducted on January 17, 1994, it was determined that there was a possibility that some of the waste may have been released to the environment underneath the floor of Building 460. Further evaluation on February 1 and 9, 1994, identified a breach in the secondary containment approximately 2.5 feet from the end of the pipe. The breach was approximately 1/4 inch by 1/2 inch in area and was located in the vicinity of a sleeve that joined two sections of pipe.¹

Physical/Chemical Description of Constituents Released

The released liquid was determined to contain levels of cadmium at 19 ppm and silver at 13 ppm that classify the material a characteristic hazardous waste.^{1,2} The concrete floor in the release area will be drilled in early May to obtain soil samples from beneath Building 460.⁴ When validated data become available, they will be submitted to EPA and CDH as a follow-up in the Eighth Quarterly Update to the HRR. Both CPIR and Tank Release Report Addenda will also be transmitted upon completion of the incident investigation.

Responses to Operation or Occurrence

The RCRA Contingency Plan was implemented and the liquid in the secondary containment was removed and placed into the process waste system on January 12, 1994.^{1,3} An engineering evaluation was conducted to identify the leaks in primary and secondary containment. The piping was taken out of service on January 12 and a decision was made not to repair the piping until further evaluation was completed. The pipes were temporarily capped to prevent inadvertent use of the system and alternate means of collection are being used for the processes that rely on the capped lines. Waste is being collected in drums with secondary containment and the waste is being transferred to the Building 460 hazardous waste collection system for disposition.^{1,4} A final evaluation of the spill area and system will be completed after validated data from the early May core samples through the building floor are received.⁴

The contaminated soil beneath the building was not initially removed or sampled for several reasons including: 1) inaccessibility of soil removal without core drilling the floor, 2) the small quantity (2 gallons) of material released to secondary containment, 3) the low level of contaminants in the released hazardous waste (19 ppm cadmium and 13 ppm silver), 4) the size of the breach in the secondary containment piping (1/4" x 1/2"), 5) the location of the piping (13.7 feet above groundwater and underneath concrete), and 6) no record of previous releases.² The remediation of any released material to the environment is being deferred until the building is closed because the spill is located two feet beneath a concrete floor.¹

Fate of Constituents Released to Environment

The release from the secondary containment piping occurred in the area of the Non-Destructive Testing Lab, located in the approximate center of Building 460. The leak is believed to have passed through the concrete floor into soil beneath the building. No previous record of leaks from the primary piping is known. Very little material was believed to have been released to the environment based on the small nature of the breach of the piping. The waste is presumed to be confined in the soil in the immediate area of the breach in the secondary containment piping.¹

It is unlikely that the release has leached into groundwater because the area of the release is protected against percolation by rain and snowmelt and is located approximately 13.7 feet above the highest recorded level of groundwater in that area of the plant.¹

Action/No-Action Recommendation

It is recommended that an action determination at this site be deferred until validated soil core samples are received.

Comments

None.

References

¹Building 460 Hazardous Waste Tank Release Report. February 28, 1994.

²Correspondence between M.L. Johnson, Waste Regulatory Programs, to G.L. Potter, Facility Management and Operations re: Documentation of Cleanup Response to Releases Occurring at Building 460 and OU 2. April 20, 1994.

³RCRA CIPR No. 94-001.

⁴Clary, Jane, 1994. Personal Communication with Ed Pasic. April 28, 1994.

PAC REFERENCE NUMBER: 600-1005

IHSS Number: NA

Unit Name: Former Pesticide Storage Area

CPIR No.: NA

Approx. Location: N748,485; E2,083,422

Date(s) of Operation or Occurrence:

Mid-1970s to Approximately 1982

Description of Operation or Occurrence

Building Site 667 was originally used to store pesticides.^{1,5} This site is located several hundred feet north of Building 850 in what is presently parking lot No. 881.¹ In approximately 1982, the shed which constituted Building 667 was moved and located west and south of Building 371. At this new location, the building was renamed Building 367, and pesticide storage in the shed resumed for an unknown time period. The shed is no longer used for pesticide storage.⁶

It is believed that pesticides were stored at the Building 667 site at least through 1978. It is possible that pesticides could have been spilled during loading or mixing operations. In addition, it is possible that the floor in the building was dirt, increasing the possibility of residual amounts of pesticides remaining at the site.² No known rinsing of pesticide containers occurred at the shed.⁴

Physical/Chemical Description of Constituents Released

Pesticides, which are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), were stored in this area.¹ It is possible that some pesticides were released to the environment. A list of pesticides known to have been stored in Building 667 follows:³

Spectracide 600 (ant killer)	Esteron 76BE (herbicide weed control)
Mouse Maze (poisoned grain for mice and pigeons)	Tordon 22K (herbicide weed control)
Bee Bopper (bee and wasp spray, includes chlordane)	Ureabor (U.S. Borax granual weed and grass control)
Malkill (insecticide)	Banvel
TMTD-Rhoplex (rabbit and deer repellant)	Diazon
Decon rodent poison grain	Poison Grain (birds)
Ortho liquid iron (grass fertilizer)	Malathion
Excel (lawn fertilizer)	Diazinon (black widow spider)
DM14 (herbicide weed control)	
Hyvar X-L (Bromacil weed killer)	

Responses to Operation or Occurrence

No known response has occurred at this location. Samples will be taken to determine what contaminants are present at the site.¹

Fate of Constituents Released to Environment

The fate of constituents released to the environment is unknown.¹

Action/No-Action Recommendation

It is recommended that this site be further investigated as part of ongoing environmental restoration activities at RFP.

Comments

This PAC will be updated as more information becomes available on the history of the site.

References

¹Demos, N.S. 1991. Interoffice Correspondence. Letter of Notification to Incorporate Building Site 667 into Operable Unit 10.

²Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) Report for Rocky Flats Plant. Fall, 1992.

³List of Pesticides Stored in Building 667. October 26, 1978.

⁴Johnson, Angie and Ann Sieben, 1991. Interview with Bob Vogel. December 4, 1991.

⁵Sieben, Ann and Angie Johnson, 1991. Interview with John Hill. December 2, 1991.

⁶Johnson, Angie, 1991. RFP Site Visit. November, 14, 1991.

PAC REFERENCE NUMBER: 900-1311

IHSS Number: N/A
Unit Name: Septic Tank East of Building 991
CPIR No.: NA
Approx. Location: N749,995; E2,086,231

Date(s) of Operation or Occurrence:

1952

Description of Operation or Occurrence

A sewage-related structure existed east of Building 991 during 1952.^{1,2,5,6,10} This structure is referred to in several documents by a variety of names including "temporary sewage disposal bed",⁷ "sewerage test area",² septic tank^{4,5,6} and wooden septic tank.¹⁰

During a recent interview, Roy Tisdale, the carpenter believed to have been contracted for construction of a wooden septic tank, recalled that the location of the structure was approximately 200-300 yards east of Building 991. Tisdale described a brownish, odorous liquid flowing from a roughly 4 inch diameter metal pipe into the wooden structure where the carpenters were working during construction of the tank. At that time, an RFP employee made a reference to this liquid needing to be kept away from the creek and nearby cattle because it could "kill the cattle," therefore, Mr. Tisdale did not complete the project because he believed that his men were being exposed to a potentially dangerous liquid. Mr. Tisdale believed that the source of the liquid was the office buildings to the west.¹⁰

Based on review of waste disposal documents during 1952, the fluid flowing into the temporary sewage disposal bed (or septic tank) is believed to have been sewage.^{4,5,6} On September 17 and 18, Paul Martin worked with Mr. Thompson of the Austin Company to install a mixing box and temporary chlorinator for the effluent of the septic tank.⁵ On September 17, the effluent from the waste disposal plant was sampled at two points: the flume coming out of the septic tank near Building 991 and the first pond just below the septic tank. Test results showed 11 ppm of dissolved oxygen. During these testing and observation activities, an RFP chemist noted that the estimated 1-2 hour septic tank retention time joined with less than the five hour retention time in the first pond below the septic tank was inadequate. He recommended a 12 hour retention time which could be accomplished by putting in more ponds.⁴ On September 25, 26 and 29, 1952, visual effluent samples taken from the septic tank were clear with no odor.⁵

In a September 17, 1952, letter to F.H. Langell, A.L. DeWaele locates the sewerage test area to the east of Building 91 (now known as Building 991) between the limited area fence and the cattle fence. He reported a mild odor at the north side of the dam, which was approximately a quarter mile from the outlet of the 91 area. He followed "the seepage from the dam about a

hundred yards to 'Womans Creek' then down the creek a few hundred yards."² It is believed that this reference to "Womans Creek" was in error and was meant to refer to Walnut Creek or South Walnut Creek, which flows by the Building 991 Area. Woman Creek is located nearly 2,000 feet south of Building 991.

A September 17, 1952, letter from John Epp to F.H. Langell describes the effluent of the sewage disposal plant as discharging from a wooden flume by gravity into a ravine with a free-fall of roughly 2 feet at the rate of 5 gallons/minute. The effluent was described as clear, white and odorless. The ditch above the discharge was dry and the ditch below the discharge contained a considerable amount of green algae. No odor was noticed at the septic tank, discharge or ditch.³

Aerial photographs taken of RFP in 1953 indicate a possible ground disturbance in the general area east of Building 91 as described by Mr. Tisdale and waste disposal documents; however, it should be noted that this photograph is of relatively poor quality.⁹

Physical/Chemical Description of Constituents Released

The influent to and effluent from the temporary waste disposal bed or septic tank is believed to have been sewage based on review of waste disposal documents during 1952.^{3,4,5,6} This sewage is expected to have had typical characteristics of sewage and is not expected to have been contaminated with radionuclides.¹

Responses to Operation or Occurrence

No documentation was identified which noted the termination of usage or removal of the septic tank; however, the Building 995 activated sewage sludge treatment system may have replaced the use of this tank in 1953.^{1,11}

Fate of Constituents Released to Environment

A wooden flume is believed to have transported the sewage effluent from the waste disposal plant's septic tank to a ditch which discharged to a pond east of Building 991 before uncontrolled release of the effluent to South Walnut Creek.^{3,5,6} This pond on South Walnut Creek is still in existence and is known as Pond B-2. No additional documentation was identified which detailed the fate of constituents released to the environment.

Action/No-Action Recommendation

It is recommended that this area be considered for further investigation.

Comments

Building 991 was one of the first buildings to become operational at RFP. It is believed that the events described in this PAC revolve around the use of a temporary sewage disposal system for Building 991 until the Building 995 (Sewage Treatment Plant) construction was complete. The

history of this building has involved very few liquid or chemical processing operations. In fact, the building has never been supplied with a process waste pipeline.

During 1952-53 a considerable amount of research and documentation was provided on the effects of nitrate on infants and on cattle and horses.^{8,12} The possibility exists that the RFP employee's reference to the liquid "killing cattle" may have some relation to nitrate poisoning in cattle. Although the concern over nitrate at RFP in the 1950s focused mainly on the ion exchange columns in Buildings 881 and 771, sewage is also a source of nitrate and may have been associated with the "cattle killing" comment.

A June 13, 1952, letter from B.P. Shepard to F.H. Langell described liquid waste disposal at Rocky Flats. The discussion of sanitary wastes, which were to be treated in Building 995 using an activated sludge sewage treatment system, did not mention the temporary sewage disposal bed or any septic tanks.¹

References

¹June 13, 1952. Internal Letter from B.P. Shepard to F.H. Langell re: Liquid Waste Disposal at Rocky Flats Plant.

²September 17, 1952. Internal Letter from A.L. DeWaele to F.H. Langell re: Sewerage Test Area East of 91 Building.

³September 17, 1952. Internal Letter from John Epp to F.H. Langell re: Inspection of Sewage Disposal Plant.

⁴September 24, 1952. Internal Letter from Glen White to J. Epp re: Analysis of Effluent from Waste Disposal Plant Near 91 Building.

⁵September 24, 1952. Internal Letter from Paul Martin to E.R. Turnquist re: Data on Sewage Samples Procedure.

⁶September 25, 1952. Internal Letter from Paul Martin to E.R. Turnquist re: Data on Sewage Samples.

⁷October 20, 1952. Letter from F.H. Langell to Gilbert C. Hoover re: Effluent from temporary Sewage Disposal Bed Near 91 Building.

⁸June 15, 1953. Letter from John Epp to E.M. Adams re: Literature References Pertaining to the Toxicity of Nitrates and Nitrites.

⁹September 21, 1953. Aerial Photograph of Rocky Flats Plant.

¹⁰January 11, 1993. Personal Communication with Roy Tisdale, retired carpenter.

¹¹ChemRisk (1992). Project Tasks 3 & 4 Final Draft Report: Reconstruction of Historical Rocky Flats Operations & Identification of Release Points. August, 1992.

¹²Walton, Graham (1952). "Survey of Literature Relating to Infant Methemoglobinemia Due to Nitrate-Contaminated Water," American Journal of Public Health, Vol. 41, No.3., August 15, 1951.

PAC REFERENCE NUMBER: 900-1312

IHSS Number: NA

Unit Name: OU 2 Water Spill

CPIR No.: 94-004

Approx. Location: N750,163; E2,086,346

Date(s) of Operation or Occurrence:

March 10, 1994

Description of Operation or Occurrence

As part of the IM/IRA activities at OU 2, surface water is collected at surface water stations SW-59, SW-61 and SW-132 and treated at the OU 2 treatment facility. As a result of separation in the primary and secondary piping associated with the OU 2 collection system, approximately 200 gallons of surface water containing hazardous waste constituents were released to the environment from the influent pipe system leading from Walnut Creek to the OU 2 treatment system. The pipeline was visually inspected eight hours prior to the discovery of the release. The leak was discovered when the influent flow totalizer meter showed a marked decrease in the amount of water entering the system and the operator proceeded to visually inspect the pipeline. The primary and secondary piping were found to be separated approximately 800 feet from the treatment unit, approximately 200 feet above the SW-61 collection point. The amount of material released to the soil was estimated to be approximately 200 gallons based on a visual determination of the size of the wetted area. In addition, possibly up to 6,000 gallons may have been released from the primary piping, flowed through secondary piping and been returned to the SW-61 collection point. Approximately 97% of the water diverted to the treatment system is collected from SW-61.¹

Physical/Chemical Description of Constituents Released

Approximately 200 gallons were released to the soil based on the area wetted by the release. In addition, up to 6,000 gallons may have been returned to the SW-61 collection point from the secondary piping. The water that was released is collected from SW-59, SW-61 and SW-132 (most of which is surface runoff from the Protected Area). Because this groundwater and surface water feeding Walnut Creek may contain hazardous waste constituents, the "contained-in" rule is considered applicable, and the water entering the OU 2 treatment system possibly contains "F001" listed hazardous waste. This determination was based on analytical results from routine sampling of the influent water which show F001 listed hazardous waste constituents in trace amounts.

Analytical results from sampling events of the influent water in May 1993 as well as the March 10 are summarized in the table on the following page with several standards provided for

comparison. Based on these historical data, F001 listed contaminants that have been detected include carbon tetrachloride, trichloroethene and tetrachloroethene. Cis-1,2-dichloroethene, chloroform, 1,1-dichloroethene, chloroform, 1,1-dichloroethene and toluene have also been detected in the influent water but not at levels that constitute characteristic hazardous waste.¹

On March 10, 1994 special samples were collected at two locations of the soil wetted by the release and from water remaining in the secondary containment of the pipeline. The volatile organic results of the water samples are contained in the table on the following page. The soil samples underwent isotopic analyses and volatile organic analyses. Preliminary volatile organics results dated March 10 for the two soil samples showed methylene chloride at 3J $\mu\text{g/kg}$, tetrachloroethene at 2J $\mu\text{g/kg}$, and 2-butanone at 4BJ $\mu\text{g/kg}$. "J" indicates that the compound was detected below practical quantification limits (PQLs) and "B" indicates that the compound was also detected in the method blank. The March 14, 1994, final results for the two soil samples showed 2-Butanone at 5BJ $\mu\text{g/kg}$, tetrachloroethene at 3J $\mu\text{g/kg}$. Radionuclide results were within background concentrations.² The validated analytical data on which this text is based follow this narrative.

Responses to Operation or Occurrence

The operator immediately shut down the inlet pumps to the pipeline and the RCRA Contingency Plan was implemented. Samples were taken of the influent water and the soil in the area affected by the release to confirm the concentration of hazardous waste constituents in the water and affected soil. The pumps were de-energized immediately after the leak was discovered and personnel immediately began repairs on the pipe. The system was back in normal operation within six hours of discovery of the leak.¹

Based on the results of the historical analytical data of influent water and the results of a previous risk assessment, a decision was made on March 10 not to immediately remove the soil impacted by the release. The initial decision was verified by a second risk assessment using the CDH methodology which resulted in an even a lower cancer risk of 10^{-7} to 10^{-8} .¹ This revised risk assessment follows this narrative.

Fate of Constituents Released to Environment

None of the material which wetted the soil or flowed into the creek was recovered. The water which leaked from the pipeline affected the soil in the area of the release. Based on all available data, the only constituent exceeding Segment 5 stream standards was tetrachloroethene (PCE). The contaminants released do not pose a significant human health risk since the estimated risk of 10^{-7} to 10^{-8} using CDH methodology is below 10^{-6} . The possible 6,000 gallons of water returned to Walnut Creek are essentially indistinguishable from the periodic overflows of the water which exceed the 60 gpm treatment requirements of the OU 2 treatment unit.¹

**VOLATILE ORGANIC COMPOUNDS DETECTED IN
THE OU 2 COLLECTION SYSTEM WATER SAMPLES**

Volatile Organic Analytes in Water Samples	Value Detected on March 14, 1994 ¹ (mg/L)	Value Detected in May 1993 ⁶ (mg/L)	SDWA ² MCLs ^{3,4} (mg/L)	RCRA TCLP Regulatory Limit ⁴ (mg/L)	CO Water Quality Standards Big Dry Creek Segment 5
Trichloroethene F001, D040	0.005	0.003	0.005	0.50	0.066
Carbon Tetrachloride F001, D019	0.002J ⁷	0.003	0.005	0.70	0.018
Tetrachloroethene F001, D039	0.005	0.002	0.005	0.50	0.0008
Cis-1,2-dichloroethene	0.009 ⁵	0.009	0.070	NA	0.170
Toluene	<0.005	0.0004	NA	NA	NA
1,1-Dichloroethene D029	<0.005	0.0008	0.007	0.07	0.000057
1,1,1-Trichloroethane	0.002J	-- ⁸	NA	NA	NA
Chloroform D022	<0.005	0.0007	NA	6.00	.006

¹ Acetone (2BJ ug/L) and 2-Butanone(4BJ) were detected in both the sample and in the method blank. B = Detected in method blank.

² SDWA--Safe Drinking Water Act

³ MCLs-- Maximum Contaminant Levels

⁴ NA--Not Applicable

⁵ Cis and Trans 1,2-dichloroethene totals combined

⁶ Based on sampling events from May 1993 (Most recent validated data prior to March 10 sample)

⁷ J Compound found below PQL. Quantitation is estimated.

⁸ -- Value not presented, probably below detection limits.

Action/No-Action Recommendation

It is recommended that this area be included for remediation under the final response action plan for OU 2.⁴ In addition, it is recommended that previous OU 2 water spills identified in existing PACs NE-1407 and 900-1309 also be incorporated under this final response action plan.

Comments

The cause of the incident is directly related to the quality of the primary and secondary piping used to transport the influent feed to OU 2 treatment unit. The results of an evaluation indicate that the piping is showing signs of aging. If collection of water at the three surface water stations continues, these pipes may need to be replaced.¹

References

¹Updated RCRA CIPR No. 94-004. (Includes Risk Assessment following CDH Methodology.)
March 31, 1994.

²Radiochemistry Report, Isotopic Analysis by Alpha Spectrometry. March 28, 1994.

³Analytical Data for Water and Soil Samples Taken from the OU 2 Spill Area. March 10, 1994.

⁴Correspondence between M.L. Johnson, Waste Regulatory Programs, to G.L. Potter, Facility Management and Operations re: Documentation of Cleanup Response to releases occurring at Building 460 and OU 2. April 20, 1994.

**Analytical Data for March 10, 1994, Soil and Water Samples
Taken From OU 2 Spill Area
and
Revised Bounding Risk Assessment for OU 2 Treatability System Spill**

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00703

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1007

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/10/94

Column: (pack/cap) CAP

Dilution Factor: 1.72

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	G
---------	----------	---	---

74-B7-3	Chloromethane	17.	U
74-B3-9	Bromomethane	17.	U
75-01-4	Vinyl Chloride	17.	U
75-00-3	Chloroethane	17.	U
75-09-2	Methylene Chloride	3.	J
67-64-1	Acetone	17.	U
75-15-0	Carbon Disulfide	9.	U
75-35-4	1,1-Dichloroethene	9.	U
75-34-3	1,1-Dichloroethane	9.	U
540-59-0	1,2-Dichloroethene (total)	9.	U
67-66-3	Chloroform	9.	U
107-06-2	1,2-Dichloroethane	21.	U
78-93-3	2-Butanone	17.	U
71-55-6	1,1,1-Trichloroethane	9.	U
56-23-5	Carbon Tetrachloride	9.	U
75-27-4	Bromodichloromethane	9.	U
78-87-5	1,2-Dichloropropane	9.	U
10061-01-5	cis-1,3-Dichloropropene	9.	U
79-01-6	Trichloroethene	9.	U
124-48-1	Dibromochloromethane	9.	U
79-00-5	1,1,2-Trichloroethane	9.	U
71-43-2	Benzene	9.	U
10061-02-6	trans-1,3-Dichloropropene	9.	U
75-25-2	Bromoform	9.	U
108-10-1	4-Methyl-2-Pentanone	9.	U
591-78-6	2-Hexanone	9.	U
127-18-4	Tetrachloroethene	9.	U
79-34-5	1,1,2,2-Tetrachloroethane	9.	U
108-88-3	Toluene	9.	U
108-90-7	Chlorobenzene	9.	U
100-41-4	Ethylbenzene	9.	U
100-42-5	Styrene	9.	U
1330-20-7	Xylenes (total)	9.	U

instrument
contamination
4/14/94 NCS

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00703

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SDIL

Lab Sample ID: 995 SPILL

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1007

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/10/94

Column: (pack/cap) CAP

Dilution Factor: 1.72

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Number TICs found: 0

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00706

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL-SITE

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR100B

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/10/94

Column: (pack/cap) CAP

Dilution Factor: 1.61

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg)	UG/KG
74-87-3	Chloromethane	16.	IU
74-83-9	Bromomethane	16.	IU
75-01-4	Vinyl Chloride	16.	IU
75-00-3	Chloroethane	16.	IU
75-09-2	Methylene Chloride	8.	IU
67-64-1	Acetone	16.	IU
75-15-0	Carbon Disulfide	8.	IU
75-35-4	1,1-Dichloroethene	8.	IU
75-34-3	1,1-Dichloroethane	8.	IU
540-59-0	1,2-Dichloroethene (total)	8.	IU
67-66-3	Chloroform	8.	IU
107-06-2	1,2-Dichloroethane	8.	IU
78-93-3	2-Butanone	4.	IU
71-55-6	1,1,1-Trichloroethane	8.	IU
56-23-5	Carbon Tetrachloride	8.	IU
75-27-4	Bromodichloromethane	8.	IU
78-87-5	1,2-Dichloropropane	8.	IU
10061-01-5	cis-1,3-Dichloropropene	8.	IU
79-01-6	Trichloroethene	8.	IU
124-48-1	Dibromochloromethane	8.	IU
79-00-5	1,1,2-Trichloroethane	8.	IU
71-43-2	Benzene	8.	IU
10061-02-6	trans-1,3-Dichloropropene	8.	IU
75-25-2	Bromoform	8.	IU
108-10-1	4-Methyl-2-Pentanone	8.	IU
591-78-6	2-Hexanone	8.	IU
127-18-4	Tetrachloroethene	2.	IU
79-34-5	1,1,2,2-Tetrachloroethane	8.	IU
108-88-3	Toluene	8.	IU
108-90-7	Chlorobenzene	8.	IU
100-41-4	Ethylbenzene	8.	IU
100-42-5	Styrene	8.	IU
1330-20-7	Xylenes (total)	8.	IU

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00706

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL-SITE

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1008

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/10/94

Column: (pack/cap) CAP

Dilution Factor: 1.61

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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RADIOCHEMISTRY REPORT
ISOTOPIC ANALYSIS BY ALPHA SPECTROMETRY

Lab Number: 94X0007
Report Date: March 28, 1994

Isotopic Analysis Results
Sample Date: 3/10/94

SAMPLE ID	URANIUM 238 (pCi/g)	BATCH #
SITE 1-S	0.84 ± 0.09	ISO94-123
SITE 1-N	0.74 ± 0.08	ISO94-123
SITE 1-ND	0.82 ± 0.09	ISO94-123

SAMPLE ID	URANIUM 235 (pCi/g)	BATCH #
SITE 1-S	0.03 ± 0.01	ISO94-123
SITE 1-N	0.02 ± 0.01	ISO94-123
SITE 1-ND	0.03 ± 0.01	ISO94-123

SAMPLE ID	URANIUM 233/234 (pCi/g)	BATCH #
SITE 1-S	0.82 ± 0.09	ISO94-123
SITE 1-N	0.76 ± 0.08	ISO94-123
SITE 1-ND	0.88 ± 0.10	ISO94-123

SAMPLE ID	PLUTONIUM 239/240 (pCi/g)	BATCH #
SITE 1-S	2.5 ± 0.3	ISO94-122
SITE 1-N	1.7 ± 0.2	ISO94-122
SITE 1-ND	1.5 ± 0.2	ISO94-122

SAMPLE ID	AMERICIUM 241 (pCi/g)	BATCH #
SITE 1-S	0.92 ± 0.15	ISO94-124
SITE 1-N	0.86 ± 0.17	ISO94-124
SITE 1-ND	0.98 ± 0.12	ISO94-124

**RADIOCHEMISTRY REPORT
ISOTOPIC ANALYSIS BY ALPHA SPECTROMETRY****Lab Number: 94X0007
Report Date: March 28, 1994****Quality Assurance/Quality Control Data**

ANALYSIS		CEL CONTROL		CONTROL STANDARD (d/m/mL)	
BATCH #	DATE	ID NUMBER	ISOTOPE	OBSERVED VALUE	STANDARD VALUE
ISO94-123	03/25/94	CEL # 603844	U-238	11.2 ± 1.2	10.4 ± 0.1
ISO94-123	03/25/94	CEL # 603844	U-233/234	10.2 ± 1.1	10.5 ± 0.1
ISO94-122	03/22/94	CEL # 670566	PU-239/240	5.8 ± 0.7	5.2 ± 0.1
ISO94-124	03/23/94	CEL # 603995	AM-241	4.4 ± 0.7	5.1 ± 0.1

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00702RE

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1402

Level: (low/med) LDW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 2.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	G
74-87-3	Chloromethane	20.	1U
74-83-9	Bromomethane	20.	1U
75-01-4	Vinyl Chloride	20.	1U
75-00-3	Chloroethane	20.	1U
75-09-2	Methylene Chloride	10.	1U
67-64-1	Acetone	20.	1U
75-15-0	Carbon Disulfide	10.	1U
75-35-4	1,1-Dichloroethene	10.	1U
75-34-3	1,1-Dichloroethane	10.	1U
540-59-0	1,2-Dichloroethene (total)	10.	1U
67-66-3	Chloroform	10.	1U
107-06-2	1,2-Dichloroethane	10.	1U
78-93-3	2-Butanone	5.	1BU
71-55-6	1,1,1-Trichloroethane	10.	1U
56-23-5	Carbon Tetrachloride	10.	1U
75-27-4	Bromodichloromethane	10.	1U
78-87-5	1,2-Dichloropropane	10.	1U
10061-01-5	cis-1,3-Dichloropropene	10.	1U
79-01-6	Trichloroethene	10.	1U
124-48-1	Dibromochloromethane	10.	1U
79-00-5	1,1,2-Trichloroethane	10.	1U
71-43-2	Benzene	10.	1U
10061-02-6	trans-1,3-Dichloropropene	10.	1U
75-25-2	Bromoform	10.	1U
108-10-1	4-Methyl-2-Pentanone	10.	1U
591-78-6	2-Hexanone	10.	1U
127-18-4	Tetrachloroethene	10.	1U
79-34-5	1,1,2,2-Tetrachloroethane	10.	1U
108-88-3	Toluene	10.	1U
108-90-7	Chlorobenzene	10.	1U
100-41-4	Ethylbenzene	10.	1U
100-42-5	Styrene	10.	1U
1330-20-7	Xylenes (total)	10.	1U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00702RE

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1402

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 2.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00707RE

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SOIL

Lab Sample ID: 995 SPILL-SITE

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1403

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 1.92

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	UG/KG	
74-87-3	Chloromethane	19.	U
74-83-9	Bromomethane	19.	U
75-01-4	Vinyl Chloride	19.	U
75-00-3	Chloroethane	19.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	19.	U
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	5.	BU
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	3.	J
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00707RE

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) SDIL

Lab Sample ID: 995 SPILL-SITE

Sample wt/vol: 3. (g/mL) G

Lab File ID: MAR1403

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 0.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 1.92

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	G
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

00709

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: DU2 PIPE

Sample wt/vol: 5. (g/mL) ML

Lab File ID: MAR1401

Level: (low/med) LDW

Date Received: 3/10/94

% Moisture: not dec.100.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	g
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74-87-3-----	Chloromethane	10.	U
74-83-9-----	Bromomethane	10.	U
75-01-4-----	Vinyl Chloride	10.	U
75-00-3-----	Chloroethane	10.	U
75-09-2-----	Methylene Chloride	5.	U
67-64-1-----	Acetone	2.	BJ
75-15-0-----	Carbon Disulfide	5.	U
75-35-4-----	1,1-Dichloroethene	5.	U
75-34-3-----	1,1-Dichloroethane	5.	U
540-59-0-----	1,2-Dichloroethene (total)	9.	
67-66-3-----	Chloroform	5.	U
107-06-2-----	1,2-Dichloroethane	5.	U
78-93-3-----	2-Butanone	4.	BJ
71-55-6-----	1,1,1-Trichloroethane	2.	J
56-23-5-----	Carbon Tetrachloride	2.	J
75-27-4-----	Bromodichloromethane	5.	U
78-87-5-----	1,2-Dichloropropane	5.	U
10061-01-5-----	cis-1,3-Dichloropropene	5.	U
79-01-6-----	Trichloroethene	5.	
124-48-1-----	Dibromochloromethane	5.	U
79-00-5-----	1,1,2-Trichloroethane	5.	U
71-43-2-----	Benzene	5.	U
10061-02-6-----	trans-1,3-Dichloropropene	5.	U
75-25-2-----	Bromoform	5.	U
108-10-1-----	4-Methyl-2-Pentanone	5.	U
591-78-6-----	2-Hexanone	5.	U
127-18-4-----	Tetrachloroethene	5.	
79-34-5-----	1,1,2,2-Tetrachloroethane	5.	U
108-88-3-----	Toluene	5.	U
108-90-7-----	Chlorobenzene	5.	U
100-41-4-----	Ethylbenzene	5.	U
100-42-5-----	Styrene	5.	U
1330-20-7-----	Xylenes (total)	5.	U

1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

00709

Lab Name: GLAB

Contract:

Lab Code: GLAB

Case No.:

SAS No.: 94X0

SDG No.:

Matrix: (soil/water) WATER

Lab Sample ID: DU2 PIPE

Sample wt/vol: 5. (g/mL) ML

Lab File ID: MAR1401

Level: (low/med) LOW

Date Received: 3/10/94

% Moisture: not dec. 100.

Date Analyzed: 3/14/94

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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INTEROFFICE CORRESPONDENCE

DATE: March 29, 1994

TO: M. C. Broussard, EOM, Bldg. 080, X8517

FROM: J. K. Hopkins, EE&T, Bldg. 080, X8636

SUBJECT: REVISED BOUNDING RISK ASSESSMENT FOR OU 2 TREATABILITY SYSTEM SPILL - JKH-027-94

A revised risk assessment was performed on the small spill of water present in the OU 2 Treatability System. Instead of using chemical concentrations in water, the revised assessment is based on extrapolated chemical concentrations in soil, as requested by CDH.

Attached are the computer spreadsheets for a screening-level assessment of human health risks. The spreadsheet format, exposure parameters, parameter default values, and the intake equations follow the CDH Interim Final Guidance for risk assessments used to determine the need for a Corrective Measures Study (CMS) at a RCRA facility (CDH, 1993).

As shown in the lower right-hand corner of Table 2, the estimated upper-bound total added cancer risk from ingestion of soil, dermal contact with soil, and inhalation of soil particles by the future on-site resident at OU 2 is between $1\text{E-}7$ and $1\text{E-}8$, or an added cancer incidence between 1 in 10 million and 1 in 100 million. The risk screening threshold proposed by CDH for making a determination of need for a CMS is a cumulative risk of $1\text{E-}6$. Thus, using the CDH screening-level risk assessment methodology, the small spill at OU 2 appears to present a potential cancer risk level at least one order of magnitude less than the CDH screening threshold.

As shown in the lower right-hand corner of Table 3, the estimated upper-bound total HQ (Hazard Quotient) for noncancer health effects is between $1\text{E-}02$ and $1\text{E-}03$, or between 0.1% and 1% of the cumulative risk screening threshold proposed by CDH ($\text{HQ}=1$). Thus, using the CDH methodology, the small spill at OU 2 appears to present a potential noncancer health risk level at least two orders of magnitude less than the CDH screening threshold.

Because measured soil concentrations of seven COCs (Chemicals of Concern) identified in the water spilled at the OU 2 Field Treatability Unit were unavailable, it was necessary to extrapolate maximum surface soil concentrations on the very conservative basis of 40% soil moisture at saturation, i.e., the measured water concentrations were multiplied by 0.4 to estimate maximum soil concentrations. A maximum soil moisture of 40% is generally typical of a moderately compacted soil; actual maximum soil moisture recorded at OU 2 is about 30%, with an average nearer to 20%, according to OU 2 records.

M. C. Broussard
March 29, 1994
JKH-027-94
Page 2 of 2

This specific application of CDH's proposed RCRA screening-level risk assessment methodology to a very small spill at OU 2 (viz., 10 gallons) appears to indicate no need for a CMS, at least on the basis of soil-related risks (CDH proposes that water will be screened on the basis of an ARAR rather than a risk level). Still, it appears that the risk levels projected using the CDH methodology can overstate the reasonable upper-bound risks by many orders of magnitude. As a means of supporting this conclusion, the exposure assessment scenario implicit in the CDH default exposure factors and intake equations is outlined in Attachment 2 as it applies to the 10-gallon spill at OU-2.

If you have any questions or comments, please contact either myself or W. Roth-Nelson, both at X8636.

WRN:cet

Attachment:
As Stated

cc:

G. M. Anderson
M. C. Burmeister
W. S. Busby
J. K. Hopkins
P. J. Laurin
R. E. Madel
A. L. Primrose
M. T. Vess

TABLE 1											
RESIDENTIAL EXPOSURE QUANTIFICATION--Intake Calculation: OU-2 Spill at Field Treatability Unit											
Max Concentration (Cmax) at SWMU or CAMU											
Contaminant of Concern (COC)											
Modelled:		cis-1,2 DCE		1,1 DCA		TCE		PCE			
Surface Soil (mg/kg) (1)		3.60E-03	3.60E-03	3.20E-04	3.20E-04	1.20E-03	1.20E-03	8.00E-04	8.00E-04		
Airborne Soil Particulates (mg/m3) (2)		7.80E-07	7.80E-07	6.40E-08	6.40E-08	2.60E-07	2.60E-07	1.70E-07	1.70E-07		
Indoor Airborne Soil VOCs (mg/m3)		NA	NA	NA	NA	NA	NA	NA	NA		
Route of Exposure and Intake (I _{max})		Noncar- cinogen (NC)		Carcino- gen (C)		Noncar- cinogen (NC)		Carcino- gen (C)		Noncar- cinogen (NC)	
SOIL INGESTION:											
Child Intake (mg/kg-d) (3)(4)		4.60E-07	3.95E-08	4.09E-08	3.51E-09	1.53E-07	1.32E-08	1.02E-07	8.77E-09		
Adult Intake (mg/kg-d) (5)(6)		4.93E-08	1.69E-08	4.38E-09	1.50E-09	1.64E-08	5.64E-09	1.10E-08	3.76E-09		
TOTAL INTAKE		5.10E-07	5.64E-08	4.53E-08	5.01E-09	1.70E-07	1.88E-08	1.13E-07	1.25E-08		
SOIL DERMAL CONTACT:											
Child Intake (mg/kg-d) (7)(8)		5.29E-06	4.54E-07	4.71E-07	4.03E-08	1.76E-06	1.51E-07	1.18E-06	1.01E-07		
Adult Intake (mg/kg-d) (9)(10)		1.75E-06	6.00E-07	1.56E-07	5.34E-08	5.84E-07	2.00E-07	3.89E-07	1.33E-07		
TOTAL INTAKE		7.04E-06	1.05E-06	6.26E-07	9.37E-08	2.35E-06	3.51E-07	1.57E-06	2.34E-07		
SOIL PARTICLE INHALATION:											
Child Intake (mg/kg-d) (11)(12)		1.89E-15	1.62E-16	1.55E-16	1.33E-17	6.29E-16	5.39E-17	4.11E-16	3.52E-17		
Adult Intake (mg/kg-d) (13)(14)		4.60E-16	1.58E-16	3.77E-17	1.29E-17	1.53E-16	5.25E-17	1.00E-16	3.44E-17		
TOTAL INTAKE		2.35E-15	3.19E-16	1.93E-16	2.62E-17	7.82E-16	1.06E-16	5.11E-16	6.96E-17		

Note: (1) $C_{max} \text{ (mg/kg)} = C_{max} \text{ (mg/L)} \cdot 0.4 \text{ (40\% soil moisture at saturation in moderately compacted soil)}$.

Note: (2) $C_{max} \text{ (mg/m}^3\text{)} = C_{max} \text{ (mg/kg)} / 4630 \text{ m}^3/\text{mg (PEF, particulate emission factor from EPA RAGS, Part B)}$.

Note: (3) $I_{max} \text{ (Child NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.3E-4 \text{ (CDH RCRA standard default intake factor)}$.

(4) $I_{max} \text{ (Child C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.1E-5 \text{ (CDH)}$.

Note: (5) $I_{max} \text{ (Adult NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.4E-5 \text{ (CDH)}$.

(6) $I_{max} \text{ (Adult C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 4.7E-6 \text{ (CDH)}$.

Note: (7) $I_{max} \text{ (Child NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.5E-3 \text{ (CDH)}$.

(8) $I_{max} \text{ (Child C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.3E-4 \text{ (CDH)}$.

Note: (9) $I_{max} \text{ (Adult NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 4.9E-4 \text{ (CDH)}$.

(10) $I_{max} \text{ (Adult C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.7E-4 \text{ (CDH)}$.

Note: (11) $I_{max} \text{ (Child NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.9E-15 \text{ (CDH)}$.

(12) $I_{max} \text{ (Child C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.6E-16 \text{ (CDH)}$.

Note: (13) $I_{max} \text{ (Adult NC, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 4.6E-16 \text{ (CDH)}$.

(14) $I_{max} \text{ (Adult C, mg/kg-d)} = C_{max} \text{ (mg/kg)} \cdot 1.6E-16 \text{ (CDH)}$.

TABLE 2									
RESIDENTIAL RISK CHARACTERIZATION--									
Risk Calculation for Carcinogens: OU-2 Spill at Field Treatability Unit									
Route of Exposure and Risk (Rmax)	Contaminant--Carcinogen								
	cis-1,2 DCE	1,1 DCA	TCE	PCE	Carbon Tet	Chloro form	Toluene		
SOIL INGESTION									
Total Intake (mg/kg-day)*	5.64E-08	5.01E-09	1.88E-08	1.25E-08	1.88E-08	4.38E-09	2.50E-09		
Slope Factor (mg/kg-day)-1=	NA	NA	1.10E-02	5.20E-02	1.30E-01	6.10E-03	NA		
Added Cancer Risk	NA	NA	2.07E-10	6.51E-10	2.44E-09	2.67E-11	NA		
SOIL DERMAL CONTACT									
Total Intake (mg/kg-day)*	1.05E-06	9.37E-08	3.51E-07	2.34E-07	3.51E-07	8.20E-08	4.68E-08		
Slope Factor (mg/kg-day)-1=	NA	NA	1.10E-02	5.20E-02	1.30E-01	6.10E-03	NA		
Added Cancer Risk	NA	NA	3.86E-09	1.22E-08	4.57E-08	5.00E-10	NA		
SOIL PARTICLE INHALATION									
Total Intake (mg/kg-day)*	3.19E-16	2.62E-17	1.06E-16	6.96E-17	1.08E-16	2.46E-17	1.43E-17		
Slope Factor (mg/kg-day)-1=	NA	NA	6.00E-03	2.00E-03	5.30E-02	8.10E-02	NA		
Added Cancer Risk	NA	NA	6.39E-19	1.39E-19	5.64E-18	1.99E-18	NA		
Total Residential Contaminant-Specific Added Cancer Risk	NA	NA	4.07E-08	1.28E-08	4.81E-08	5.27E-10	NA		
TOTAL RESIDENTIAL ADDED CANCER RISK									8.55E-08

RESIDENTIAL RISK CHARACTERIZATION-

RESIDENTIAL RISK CHARACTERIZATION-

Risk Calculation for Noncarcinogens: OU-2 Spill at Field Treatability Unit

Route of Exposure and Risk (Rmax)	Contaminant--Noncarcinogen						
	cis-1,2 DCE	1,1 DCA	TCE	PCE	Carbon Tet	Chloro- form	Toluene
SOIL INGESTION							
Total Intake (mg/kg-day)/	5.10E-07	4.53E-08	1.70E-07	1.13E-07	1.70E-07	3.96E-08	2.26E-08
Reference Dose (mg/kg-day)=	1.00E-02	1.00E-01	NA	1.00E-02	7.00E-04	1.00E-02	2.00E-01
Hazard Quotient	5.1E-05	4.53E-07	NA	1.13E-05	2.43E-04	3.96E-06	1.13E-07
SOIL DERMAL CONTACT							
Total Intake (mg/kg-day)/	7.04E-06	6.26E-07	2.35E-06	1.57E-06	2.35E-06	5.48E-07	3.13E-07
Reference Dose (mg/kg-day)=	1.00E-02	1.00E-01	NA	1.00E-02	7.00E-04	1.00E-02	2.00E-01
Hazard Quotient	7.04E-04	6.26E-06	NA	1.57E-04	3.35E-03	5.48E-05	1.57E-06
SOIL PARTICLE INHALATION							
Total Intake (mg/kg-day)/	2.35E-15	1.93E-16	7.82E-16	5.11E-16	7.82E-16	1.81E-16	1.05E-16
Reference Dose (mg/kg-day)=	NA	1.00E-01	NA	NA	NA	NA	NA
Hazard Quotient	NA	1.93E-15	NA	NA	NA	NA	NA
Total Residential Contaminant-- Specific Hazard Quotient							
	7.55E-04	6.71E-06	NA	1.68E-04	3.60E-03	5.87E-05	1.68E-05
TOTAL RESIDENTIAL HAZARD QUOTIENT							
							4.59E-03

EXPOSURE ASSESSMENT SCENARIO
OU-2 TREATABILITY WATER SPILL

As the CDH methodology does not permit any soil chemical fate and transport assumptions or extrapolations, it is necessary to hypothesize steady-state conditions over 30 years. Within the upper surface soil horizon where the spill was assumed to saturate the pore space, there must be . . .

- No volatilization of the seven volatile chemicals contained in the spill water;
- No dilution from infiltration of rainwater and snowmelt;
- No leaching of these chemicals to lower soil strata;
- No chemical or biological degradation in the soil matrix; and
- No other form of attenuation can occur.

Since the seven volatile COCs are apt to volatilize rapidly and otherwise attenuate rapidly to near-zero concentrations in the confined source area of the spill, the potential exists for exaggeration of upper-bound risks by many orders of magnitude.

A 10-gallon spill can be assumed to infiltrate to saturation in the upper 6 inches of soil with a surface area of, perhaps, 6 or 7 sq ft, or <0.2% of the area of a quarter-acre residential lot on which a future 30-year resident can ingest soil, make dermal contact with soil, and inhale soil particles.

As to incidental soil ingestion, it is necessary under proposed CDH guidance to assume that a child will ingest soil at a near-maximum rate *year-round* over a 6-year period, then continue ingesting soil as an adult year-round over a 24-year period, without regard to weather, all the while confined to the tiny area of the spill. CDH makes no provision for the site-specific FI factor or the Fraction Ingested from the contaminated source area, which is a standard factor in EPA's intake equation for soil ingestion. The impact of these rules is, in this instance at OU-2, likely to result in several orders of magnitude of reasonable worst-case risk exaggeration.

Similarly, as to dermal contact with soil, it is necessary to assume that a 30-year resident will contact surface soil year-round at a near-maximum rate of soil adherence to skin, with the head, hands, arms, legs and feet of the child exposed *year-round*, and thereafter with the head, hands, arms and lower legs of the adult exposed year-round. EPA has specified that the dermal exposure frequency should account for local weather conditions (RAGS, 1989). The implausibility of CDH assumptions is compounded by the overriding assumption that all dermal contact will occur over 30 years within the 6 to 7-sq-ft area of the spill at OU-2. Accordingly, it is not surprising that projected dermal contact risk exceeds the soil ingestion risk by an order of magnitude, while it is typical that soil ingestion will contribute more risk than dermal contact.

Other assumptions affecting the inhalation risks are similarly implausible, but the relative risk contributed by the inhalation route of exposure adds virtually no risk to total cancer and noncancer risks.

A further concern is that CDH screening rules are applied to COCs in soil much more conservatively than to the same COCs in water. By screening the route of exposure to chemicals in drinking water using the most stringent water quality standards, the risk screening levels applied to soil can be orders of magnitude lower and more restrictive than the equivalent risk levels of water quality standards. For example, one COC in the water spilled at OU-2 was carbon tetrachloride, with a Primary MCL (Maximum Contaminant Level) of 5 ug/L. While the maximum reported level of carbon tetrachloride in water at the OU-2 Field Treatability Unit was 3 ug/L, the standardized cancer risk level at MCL is set at 1E-5, based only on ingestion of water combined with inhalation of water volatiles released in household use of water (EPA Region 10, 1991).

Thus, the CDH screening rules are applied to carbon tetrachloride in water much more liberally (1E-5, not including the cancer effects of six other COCs and not including the dermal contact route of exposure), as compared to that same COC in soil (1E-6, including the cancer effects of all seven COCs and all routes of exposure). At OU-2, the *sum* of COC cancer risks from seven COCs in soil and three routes of exposure to soil COCs must not exceed the 1E-6 threshold. These two cancer risk screening levels—1E-6 for summed risks in soil and 1E-5 just for one COC in water are many orders of magnitude apart and illustrate that water is to be screened much more liberally than soil.

Presumably, the default values and equations specified by CDH serve the purpose of screening the potential risks at the level of a reasonable worst case, i.e., the bounding risk estimate for the MEI (Maximally Exposed Individual). EPA Exposure Assessment Guidelines (1992) stipulate the only utility of the bounding risk estimate is to eliminate certain environmental pathways and routes of exposure from a full risk assessment, i.e., to identify the risk-driving pathways and routes that will require detailed assessment. EPA states that a bounding estimate "certainly cannot be used for an estimate of actual exposure (since by definition it is clearly outside the actual distribution)." The actual risk distribution would include the *average* intakes and risks, as well as those for RME or Reasonable Maximum Exposure.

Although the bounding risk estimate is useful for screening out environmental pathways and routes of exposure that contribute insignificantly to overall risks, it should rely on credible assumptions. As a test for reaching a decision on the need for corrective action at a RCRA facility, the bounding estimate appears highly inappropriate. Further, the practice of mixing water quality standards presenting highly variable risk levels with uniform risk-based soil screening criteria appears highly inconsistent.

3.0. REVISED PAC NARRATIVES

3.0. REVISED PAC NARRATIVES

Section 3.0 provides updated copies of PACs existing prior to the Seventh Quarterly Update. Section 3.1 includes the Rocky Flats Plant's responses to the EPA's comments on the Sixth Quarterly Update. These are identified in the "Comments" section of each narrative. PAC narratives revised in response to EPA's comments include PACs 400-812, PAC 900-1309 and PAC 600-1004 (formerly identified as PAC 400-820).

Section 3.2 provides revised copies of other existing PACs which have been renumbered to better reflect their mapped location. No other substantive changes have been made to these PACs. The original PAC number is identified in the "Comments" section of each PAC. Clean copies of these PAC narratives are being resubmitted to limit possible confusion over number changes. These PACs are identified in the table below with original numbers followed by revised numbers:

Table 2
Revised PAC Number Cross-Reference Table

IHSS	OU	Revised PAC Number	Original PAC Number	PAC NAME	Original Quarterly Update #
NA	2	NE-1405	NE-1404	Diesel Fuel Spill at Field Treatability Unit	3
NA	2	NE-1408	NE-1406	OU 2 Test Well	4
NA	4	NE-1409	000-503	Modular Tanks and 910 Treatment System Spill	5
NA	10	NW-1500	NW-175	Diesel Spill at PU&D Yard	2
NA	10	NW-1501	NW-176	Asbestos Release at PU&D Yard	2
114	7	NW-1502	NW-177	Improper Disposal of Diesel Contaminated Material at Landfill	2
NA	NA	100-613	000-501	Asphalt Surface in Lay Down Yard North of Building 130	4
152, 157.1, 172	12	600-1004	400-820	Central Avenue Ditch Cleaning Incident ¹	6
NA	NA	900-1310	000-502	ITS Water Spill	2

¹PAC 600-1004 is included in Section 3.1; therefore, it is not duplicated in Section 3.2.

Section 3.1

Revised Quarterly Updates Based on EPA Comments on the Sixth Quarterly Update

PAC REFERENCE NUMBER: 400-812

IHSS Number: N/A

Unit Name: RCRA Unit # WMU 40.09, Tank T-2 in Building 460

Approx. Location: N748,918; E2,081,817

Date(s) of Operation or Occurrence

November 10, 1993

Description of Operation or Occurrence

A release of process aqueous water occurred when Liquid Waste Operations (LWO) personnel were transferring 3,500 gallons of process aqueous water, which were generated in Building 460 and contained in Tank T-2, to a 4,000 gallon tanker truck for transport to Building 374. The spill was noticed 90 minutes into the operation when LWO personnel observed material coming from an air vent on top of the tanker. Approximately 25 gallons of liquid were released onto the pavement and dock area outside of door 5, north of Building 460.¹

Physical/Chemical Description of Constituents Released

The 25 gallons of material released to the pavement and dock were initially characterized as potentially containing the characteristic hazardous waste chromium (D007). A field pH test was performed and the released material was determined to have a pH of 6.0 to 6.5. Based on preliminary analytical screening results completed on November 11, the released material did not contain arsenic, barium, cadmium, lead or selenium. Levels of chromium were detected but were well below the regulatory limit for the characteristic of toxicity due to chromium (5.0 ppm). Undigested Inductively Coupled Plasma (ICP) sweep results showed the level of chromium to be less than 0.5 ppm. Based on these preliminary analytical results reported in CPIR 93-009, the released material was not a hazardous waste.¹ The results are considered preliminary because they have not yet been validated.

Responses to Operation or Occurrence

The RCRA Contingency Plan was implemented as described in CPIR 93-009, and CDH and EPA were notified of the occurrence. LWO personnel immediately shut down the pumps from Building 460 and secured the discharge valves from Tank T-2 to prevent additional waste from entering the tanker. Building 460 personnel took immediate action to contain the spread of material to the immediate area by laying down absorbent socks to block the flow of material. The Rocky Flats General Labs Sample Team collected samples of the material inside the tanker, the material released onto the ground around the tanker and the soil under the tanker. The RFP Haz-Mat team collected approximately 12 gallons of free liquids into a shop vacuum after the material was sampled and placed it back into the Building 460 process waste system. The

absorbent socks and disposable personal protective equipment and the disposable equipment used by the sample team were drummed and placed in the Building 460 RCRA 90-day accumulation area. On November 11, 1993, the affected soil was excavated and drummed as a precautionary measure to prevent the spread of possible contamination due to a threatening snowstorm. All clean-up activities were conducted under the guidance of the RFP Haz-Mat Team.¹

Fate of Constituents Released to Environment

Of the 25 gallons released to the environment, approximately 12 gallons of material were recovered and placed back in the Process Waste System of Building 460. The remainder evaporated from the pavement and/or soaked into the soil in the vicinity of the tanker. The soil affected by the release was recovered and drummed, generating 8 drums of material which were stored in the temporary 90-day accumulation area for Building 460.¹ Upon receipt of data for samples collected for the drummed soil, EG&G Waste Regulatory Programs declared the material non-hazardous, and it was redistributed in the immediate vicinity of the release.²

Comments

In response to EPA's April 14, 1994, comments on this PAC, the analytical data for the soil samples cited as non-hazardous in the discussion will be provided as soon as they are validated.

References

¹November 19, 1993. Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) No. 93-009.

²January 31, 1994. Personal Communication with M. L. Johnson, EG&G Waste Regulatory Programs.

PAC REFERENCE NUMBER: 600-1004

IHSS Number(s): 152, 157.1, 172

Unit Name: Central Avenue Ditch Soil Spreading

Approx. Location: N749,273; E2,082,865

Date(s) of Operation or Occurrence:

September 27, 1993

Description of Operation or Occurrence

During a walkdown tour of several IHSSs, EG&G Environmental Restoration Management (ERM) and CDH representatives observed EG&G Plant Services spreading excavated soils from the Central Avenue Ditch (IHSS 157.1 for OU 13 and IHSS 172 for OU 8) into areas adjacent to the two large fuel oil tanks located on the southwest corner of Central Avenue and Seventh Street (IHSS 152).¹

A review of the operation revealed that Plant Services spread the ditch spoils into IHSS 152 without authorization from ERM. These instructions were in conflict with the April 7, 1993 Environmental Assessment for Construction Activities (Soils Disturbance Permit #TG048663) which provided specific instructions that all dirt, soil, gravel and rock removed from any of the ditches to be cleaned were to remain on the bank of the ditch and in the immediate area from which they were originally removed. All material removed was to be spread and incorporated into the banks of the ditch. Although no soil and/or water samples were to be required for this work, radiological screening was to be required when working in any of the IHSSs involved in this activity.¹

Physical/Chemical Description of Constituents Released

Potentially contaminated dirt from IHSSs 157.1 and IHSS 172 was spread into the IHSS 152 area. The Central Avenue Ditch (IHSS 157.1) underwent a High Purity Germanium (HPGe) radiological survey both before the disturbance and again afterward and no radiological contamination was observed above background levels in either case.¹

Responses to Operation or Occurrence

The operation was immediately shut down due to the potential of cross contamination from one or more IHSSs to IHSS 152. Additional sampling will be required from one location in IHSS 152 for analytical parameters required in the OU 13 Work Plan for IHSS 157.1. In the event that

soil sampling results indicate cross contamination from one IHSS to another, ERM recommended that the area be investigated during implementation of the OU 12 Integrated Surface Water and Sediment Field Sampling Plan.¹

In addition to these actions, several actions were taken to prevent a similar occurrence in the future. In general, these include briefings/training of construction and maintenance personnel by ERM to increase awareness of proper procedures by non-ER employees working in IHSS areas.¹

Fate of Constituents Released to Environment

Potentially contaminated dirt from Central Avenue Ditch was spread into IHSS 152 adjacent to the ditch and adjacent to two large fuel tanks. The results of soil sampling from one location in IHSS 152 will help determine whether contaminants from the ditch impacted the area.¹

Comments

In response to EPA comments on the original submittal of this PAC, the radiological findings from High Purity Germanium (HPGe) detectors will be reported and evaluated in a future HRR quarterly report. The reporting of HPGe results is inappropriate at this time because HPGe field results are being confirmed by laboratory analysis. Interference in field HPGe results are possible due to nearby buildings containing radionuclides, and there is uncertainty over the exact coordinates where HPGe field results were obtained. The radiological implications of these HPGe results will be incorporated into a future HRR update once these issues are addressed.

This PAC was formerly identified as PAC 400-820 in the Sixth Quarterly Update. It has been renumbered to more accurately reflect its mapped location.

References

- ¹EG&G, 1993. "Construction Activities in or Near Individual Hazardous Substance Sites," Internal Correspondence from N.M. Hutchins, Acting Associate General Manager Environmental Restoration Management, to J.K. Hartman and R.J. Schassburger, USDOE, November 12.

PAC REFERENCE NUMBER: 900-1309

IHSS Number: N/A

Unit Name: OU 2, Field Treatability Unit

Approx. Location: N750,000; E2,082,000

Date(s) of Operation or Occurrence

December 4, 1993

Description of Operation or Occurrence

Approximately 10 gallons of potentially contaminated water from an influent pipe system leading from Walnut Creek to the OU 2 treatment system were released to the environment. The release was detected when a contractor responded to an alarm indicating that the release had occurred. The contractor identified a slow leak coming from a connection in the secondary containment portion of the influent pipeline. The source of the leak was a hole in the primary pipeline which resulted from the separation of two pipes which make up the secondary pipeline. Thirty to forty gallons of the water were contained by the secondary containment structure. The 10 gallon release estimate was based on visual observation of the wetted soil area. No IHSS was involved in this incident.¹

Physical/Chemical Description of Constituents Released

Approximately 10 gallons of contaminated water designated as an "F001" listed hazardous waste were released. The sources of the water being collected for treatment were SW59, SW61, and SW132, which contain mostly surface water runoff from the Protected Area (PA). This water is treated for removal of volatile organics, soluble metals and radioactive constituents and is sampled weekly for characterization. The most recent sampling activities relative to the time of the incident took place on December 8, 1993. Based on over 100 sampling events that occurred from May 29, 1991 to December 3, 1993, F001 listed contaminants including carbon tetrachloride, methylene chloride, trichloroethene and tetrachloroethene. Additionally, chromium and 1,2-dichloroethene, chloroform, 1,1-dichloroethane, and 1,1-dichloroethene have been detected in the influent water at low levels. Other contaminants that have been tested for but not detected include acetone, vinyl chloride, barium, cadmium, lead and mercury. Water potentially contaminated with previously detected wastes is normally treated in a Chemical Precipitation/Microfiltration/Granular Activated Carbon system to remove these contaminants from the water before being returned to the creek.¹

Responses to Operation or Occurrence

The RCRA Contingency Plan was implemented as described in CPIR No. 90-010. The pumps were immediately shut down and the contractor personnel visually inspected the line for the release. An emergency work package was initiated to repair the line, which was returned to service on December 8, 1993. The released material was not directly recoverable because it soaked into the soil. Based on previous analytical results of the contaminated water, the immediate removal of the affected soil was not required because the contaminant concentrations in the soil should not pose an unacceptable risk to human health and the environment.¹ On January 7, 1994, a risk assessment was completed using the influent water data and acceptable risk between 10^{-4} and 10^{-6} was verified.² Since original issuance of this PAC, a revised risk assessment was completed using CDH methodology, the resulting risk assessment showed even lower cancer risk at between 10^{-7} and 10^{-8} and a non-cancer health effect between 10^{-2} and 10^{-3} . Cancer risks are at least one order of magnitude below CDH's screening threshold, and non-cancer risks are at least two orders of magnitude below the CDH screening threshold.³

Fate of Constituents Released to Environment

Ten gallons of contaminated water leaked into the soil. The point of release was located under a road culvert. The contaminated soil was not removed.¹

Comments

In response to EPA's April 14, 1994, comments on this PAC, the analytical data for the water samples analyzed on December 3 and December 8, 1993 will be attached as soon as validated data are available. In addition, since issuance of this PAC, a revised Risk Assessment was performed using CDH methodology showing lower risk than originally reported in this report. A copy of this risk assessment is attached to PAC 900-1312 in Section 2.0 of the Seventh Quarterly Update.

References

¹December 16, 1993. Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) No. 93-010.

²January 31, 1994. Personal Communication with N.S. Demos, EG&G Environmental Restoration Management.

³Revised Bounding Risk Assessment for OU 2 Treatability System Spill. March 29, 1994.

Section 3.2

Revised Quarterly Updates Reflecting Revised PAC Identification Numbers

PAC REFERENCE NUMBER: NE-1405

IHSS Number: Not Applicable

Unit Name: OU 2, Phase 2, Field Treatability Unit

Approx. Location: N749,971; E2,087,177

Date(s) of Operation or Occurrence

The OU 2 Field Treatability Unit has been in operation from May 13, 1991 to the present.

An occurrence was reported on January 14, 1993.

Description of Operation or Occurrence

A release to the environment of greater than the reportable quantity (RQ) of RCRA-regulated hazardous waste was reported at 9:00 a.m. January 14, 1993. The hazardous substance release was the result of overfilling a diesel fuel tank which supplied a portable generator for the OU 2 Treatment Facility.

Approximately 20 gallons of fuel were spilled onto the ground while fueling operations were taking place. The release was cleaned up with absorbent material and later excavated until all indication of fuel presence was gone. Seventeen gray drums were filled the following day with soil contaminated by diesel fuel.

Physical/Chemical Description of Constituents Released

Based upon process knowledge, diesel spills and excavated soils are managed as RCRA-regulated waste until sampling and analysis can confirm that levels of benzene do not exceed the TCLP limit. The EPA waste code for this waste is D018. The location of the spill is not within an IHSS boundary.

Responses to Operation or Occurrence

Prior to excavation of soils in the spill area, sampling was conducted to determine if potential RCRA contaminants were present. Six total samples were collected from the spill area. Two samples were collected from soil mixed with diesel fuel, another two samples were collected from a nearby snowbank which absorbed some of the diesel. Analytical data show that the spilled diesel fuel was not a RCRA-regulated waste. The analysis consisted of TAL VOA's and TCLP volatiles. The soil was then excavated until no presence of contamination was evident. Seventeen drums were filled with soil and road gravel were placed in the excavation.

Fate of Constituents Released to Environment

Containerized soil (17 drums) awaits off-site shipment to an incineration facility.

The area impacted by this release is submitted in accordance with the Interagency Agreement, Sections I.B.3 Notification and I.B.5.

Comments

This PAC was formerly identified as PAC NE-1404.

References

Analytical Data for Volatile Organic Analysis.

PAC REFERENCE NUMBER: NE-1408

IHSS Number: Not Applicable

Unit Name: OU 2 Test Well; Current Well Number 219-93

Approx. Location: N750,000; E2,087,314

Date(s) of Operation or Occurrence

The spill occurred on Monday, April 26, 1993 at 4:00 p.m.

Description of Operation or Occurrence

Approximately 10 gallons of groundwater was spilled when a casing being inserted into a new bedrock monitoring well forced the water out of the hole and onto the ground. An approximate 2 foot by 8 foot area was wetted in the incident.

Physical/Chemical Description of Constituents Released

Analytical testing of a well 20 feet upgradient (well 36-87) has identified the following F-001 contaminants in the groundwater: carbon tetrachloride, trichloroethylene and tetrachloroethylene. Chloroform and 1,1-dichloroethylene, both of which are chemical analytes covered by Toxicity Characteristic Leaching Procedure (TCLP), were also identified in the water upgradient from the spill site. Data from laboratory testing of water from the spill-site monitoring well are not yet available.

Responses to Operation or Occurrence

A desiccant was immediately applied to the area to absorb the water and prevent it from spreading. The wet desiccant, wet dirt from below the desiccant, and a layer of dry dirt were removed from the area, containerized, and are being managed as investigation derived material.

Fate of Constituents Released to Environment

The soil wetted by the spill was cleaned up and placed into barrels with "Aqua-Set." Approximately 1-1/2 barrels of material were removed. The material is being managed as investigation-driven material pending the results of laboratory analysis. The area was cleaned up until dry soil was encountered. Therefore, no additional threat to human health and the environment has occurred as a result of this release. The nature and extent of contamination found in well 36-87 is still under investigation as are the chemical characteristics of new monitoring well 219-93.

Comments

Table 5, below, identifies the Volatile Organic Compounds likely present in the released water along with the regulatory limit for those compounds. A release notification to the National Response Center was not required because analytical data from a nearby monitoring well were available and a reportable quantity of the F-listed constituents should not have been released. The well at which this release occurred has now been numbered as monitoring well 219-93. The description of this release is submitted in accordance with the IAG, Sections I.B.3 Notification and I.B.5 Historical Release Report for final disposition.

This PAC was formerly identified as PAC NE-1406.

References

RCRA Contingency Plan Implementation Report No. 93-005.

TABLE 5
VOLATILE ORGANIC COMPOUNDS*

ANALYTE	HIGHEST/AVERAGE VALUE DETECTED (mg/l)	REGULATORY LIMIT (mg/l)
Trichlorethylene (TCE) (F001) (D040)	96.0/50.8	0.50
Carbon tetrachloride (CCl ₄) (F001) (D019)	0.870/0.58	0.50
Tetrachloroethylene (PCE) (F001) (D039)	1.10/0.510	0.70
1,1-Dichloroethylene (1,1- DCE) (D029)	1.044/N/A	0.70
Chloroform (D022) (CHCl ₃)	1.10/0.540	6.00

Volatile Organic Compounds Sampled for but not found:

Acetone(F003)
Methylene Chloride(F001)
Vinyl Chloride(D043)
1,2-Dichloroethane(D028)
Carbon Disulfate
Toluene(F005)

* Based on quarterly sample events from March, 1991 to May, 1992.

PAC REFERENCE NUMBER: NE-1409

IHSS Number: Not Applicable

Unit Name: Modular Tanks and Building 910 Treatment System

Approx. Location: N751,710;E2,085,287

Date(s) of Operation or Occurrence

The incident occurred on July 20, 1993, sometime after a 10:30 a.m. inspection of the subject system and before 1:00 p.m. when Building 910 operators first noticed signs of the occurrence.

Description of Operation or Occurrence

Hazardous waste from the Temporary Modular Tanks which store liquid collected by the Solar Evaporation Ponds Interceptor Trench System (ITS) was being pumped to Building 910 for treatment. Approximately 4700 gallons of hazardous waste in the primary containment piping (see the attached figure, item [b4]), located between the modular tanks and the ITS sump, began leaking into the secondary containment. This waste overflowed back into the modular tank pumphouse (item [b3] on figure) due to system design. This waste was fully contained in the pumphouse secondary containment. When the liquid level in the pumphouse secondary containment rose, the local alarm was activated and the pumps automatically shut down. This alerted the Building 910 operators to the spill occurrence. When the building operators found that liquid was still siphoning out through the pump, they closed the manual valves.

Some of the hazardous waste also gravity-drained through a failed hose connection on the secondary containment piping (item [a2] on figure) located within the ITS sump. The ITS sump is equipped with automatic level controls which caused this spilled material to be pumped back into the modular tanks.

Physical/Chemical Description of Constituents Released

The released material is considered RCRA F-listed hazardous waste based on 6 CCR 1007-3 because it passes through the ITS sump (which is considered a waste generation point). Applicable EPA waste codes for the released material include F001, F002, F003, F005, F006, F007 and F009. Table 1 provides a summary of the RCRA constituents generally existing in the ITS system.

TABLE 1
SUMMARY OF STATISTICS FOR STATION SW095
1991-1992

Constituent	Number of Samples	Number of Detects	mean MG/L	Regulatory Limit (MG/L)	Estimated Amount Released (lb)
TOTAL METALS:¹					
Cadmium	24	0	.00184 ²	1.0 ²	0.000074
Chromium	26	8	.00984	5.0 ²	0.000394
Lead	28	2	.00123	5.0 ²	0.000049
Silver	22	2	.00393	5.0 ²	0.000157
ORGANICS:					
Methylene Chloride	25	0	.00230 ³	0.44 ⁴	0.000092
Carbon Tetrachloride	25	1	.00258	0.057 ⁴	0.000103
Chloroform	25	0	.00192 ³	0.046 ⁴	0.000076
Tetrachloroethene	25	0	.00250 ³	0.056 ⁴	0.000100
Toluene	25	0	.00250 ³	0.080 ⁴	0.000100
Trichloroethene	25	2	.00302	0.054 ⁴	0.000121
PLATING SUBSTANCES:					
Cyanide	25	1	.01000	1.2-1.9 ⁴	0.000400
Nickel	25	2	.01042	0.040 ⁴	0.000417

¹Concentration of metals below characteristic regulatory limit therefore, water is not regulated characteristic waste.

²TCLP maximum concentration of contaminants for toxicity characteristic.

³Mean calculated using half the detection limit for concentrations at the detection limit.

⁴Land Disposal Restricted Constituent Concentration treatment standard levels in wastewater (reference §268.43).

Responses to Operation or Occurrence

The hazardous waste that overflowed into the modular tank pumphouse was pumped into a portable tank and trucked to Building 374 for treatment. The wipes used in the final cleanup of the pumphouse were designated hazardous waste and were placed into drums stored in a RCRA satellite accumulation area.

Various actions were scheduled to be performed by August 17, 1993 to operate the system in accordance with RCRA requirements. These actions include:

1. Repair the primary transfer pipeline.
2. Modify the secondary containment of the portion of the line within the ITS sump to prevent leakage of water back into the sump. Although the portion of the line can be visually inspected, it is preferable to modify the secondary containment in this manner.
3. Retest the line following repair.
4. Complete or repair the installation of leak-detectors in the secondary containment portion of the line that were not operational at the time of the incident.
5. Confirm that the process control logic supports positive shut-down of the pumps when a leak is detected in the secondary containment system in the ITS sump.
6. Repair the remote alarm which was not operable when the liquid (waste) was released into the pumphouse.
7. Analyze pressure conditions in the Building 910 feed system to determine if components experienced an over-pressurization (repair as needed).
8. Incorporate pressure-surge control as needed to ensure "hammer-free" operation when the liquid discharge is intermittently secured by automatically operating feed valves in Building 910.

Fate of Constituents Released to Environment

No known constituents were released to the environment from this occurrence. Because the concrete sump which received the waste is unlined, the RCRA contingency plan was implemented as a precautionary measure.

Comments

This PAC was formerly identified as PAC 000-503. It has been renumbered to better reflect the area of its mapped location.

References

August 2, 1993. RCRA Contingency Plan Implementation Report No. 93-007-TGH460-93

August 4, 1993. RCRA Contingency Plan Implementation Report No. 93-007-TGH472-93

August 9, 1993. Backup Data Report for RCRA Contingency Plan Implementation Report No. 93-007-TGH-461-93

IHSS Number: Not Applicable
Unit Name: Operable Unit 10, PU&D Yard Unit
Approx. Location: N752,000; E2,082,000

Date(s) of Operation or Occurrence

1974 - Present

An occurrence was reported on December 17, 1992

Description of Operation or Occurrence

Approximately one and one half gallons of diesel fuel spilled onto the ground at the PU&D storage yard during a routine fueling operation for a fork truck. The incident was reported on December 17, 1992 to EG&G Waste Regulatory Programs, EG&G Environmental Restoration Management and the Occurrence Notification Center (ONC). A fuel nozzle assembly was placed on an automatic setting but failed to shut off automatically when the fuel tank reached capacity.

Physical/Chemical Description of Constituents Released

Based upon process knowledge, diesel spills and excavated soils are managed as RCRA-regulated waste until sampling and analysis can confirm that levels of benzene do not exceed the TCLP limit. The EPA waste code for this waste is D018. The location of the spill is identified on the enclosed map as being within the IHSS 170 boundary.

Responses to Operation or Occurrence

The soil was excavated in the spill area, after sampling was conducted to determine if potential RCRA contaminants and/or contaminants listed in the RFI/RI Work Plan for Operable Unit 10 are present. Analytical data for this spill is currently unavailable. Several drums used to contain the diesel contaminated soil will remain at the location until all the data can be reviewed. The area was surveyed on March 15, 1993.

Fate of Constituents Released to Environment

If the analysis indicate that this area is not contaminated with RCRA constituents and specific analytes listed in the RFI/RI Work Plan for Operable Unit 10 are not present, the soil will be

disposed of by incineration or offsite landfill procedures. The area impacted by this release is submitted in accordance with the Interagency Agreement (IAG), Sections I.B.3 Notification, and I.B.5.

Comments

This PAC was formerly identified as PAC NW-175 in the Second Quarterly Update.

References

M.L. Sievers GPS survey report - March 15, 1993

PAC Reference Number: NW-1501

IHSS Number: Not Applicable

Unit Name: Operable Unit 10, PU&D Yard Unit

Approx. Location: N751,500; E2,082,000

Date(s) of Operation or Occurrence

1974 - Present

An occurrence was reported on November 12, 1992

Description of Operation or Occurrence

On November 12, 1992 at 1600 hours it was discovered that a reportable quantity of asbestos (approximately 1 and 1/2 pounds) was released to the environment from a boiler being stored in the PU&D storage yard.

Physical/Chemical Description of Constituents Released

The location of the spill is identified as being within the IHSS 170 boundary. The reportable quantity (RQ) established for asbestos is more than 1 pound/pint. Analytical data gathered from samples collected on May 27, 1992 show bulk asbestos concentrations at 60% of the total volume of sample analyzed. Visual observations made on November 12, 1992 indicate that approximately 15 square feet of asbestos insulation was missing.

Responses to Operation or Occurrence

The National Response Center (NRC) was notified immediately upon discovery of the boiler and subsequent missing asbestos. Containment operations began immediately by wetting down the boiler and surrounding ground and covering the area with plastic. The boiler was wrapped with plastic and taped.

Fate of Constituents Released to Environment

An unknown amount of asbestos was released to the environment. The area impacted by this release is submitted in accordance with the Interagency Agreement (IAG), Sections I.B.3 Notification, and I.B.5.

Comments

This PAC was formerly identified as PAC NW-176 in the Second Quarterly Update.

References

As Enclosed

Analytical data from Pace Laboratories

PAC Reference Number: NW-1502

IHSS Number: 114, Operable Unit 7, Sanitary Landfill

Unit Name: Present Landfill

Approx. Location: N752,622; E2,083,007

Date(s) of Operation or Occurrence

The present sanitary landfill has been in operation from August 14, 1968 to present.

An occurrence was reported on September 25, 1992

Description of Operation or Occurrence

A release to the environment of greater than the reportable quantity (RQ) of RCRA-regulated hazardous waste was reported on September 25, 1992. The hazardous substance release was the result of improper disposal of cleanup materials (soil and absorbent) from a diesel fuel spill at the present landfill location.

Approximately one gallon of fuel was spilled onto the asphalt surface while patching the building 850 parking lot. The release was cleaned up with 50 pounds of soil and oil-dri absorbent and inadvertently taken to the landfill for disposal.

Physical/Chemical Description of Constituents Released

Based upon process knowledge, cleanup materials from diesel spills are managed as RCRA-regulated waste because the material could contain levels of benzene that exceed the TCLP limit. The EPA waste code for this waste is D018.

Responses to Operation or Occurrence

CDH was notified on September 25, 1992 that the RCRA Contingency Plan had been implemented as a precautionary measure. The Environmental Protection Agency, Region VIII was notified by facsimile on September 28, 1992. An estimated 100 pounds of material suspected to be contaminated were recovered from the landfill release location and disposed of properly.

Fate of Constituents Released to Environment

The area impacted by this release is submitted in accordance with the IAG, Sections I.B.3 Notification, and I.B.5 Historical Release Report for final disposition. Any material not recovered, will be remediated with the landfill as part of Operable Unit 7.

Comments

This PAC was formerly identified as PAC NW-177 in the Second Quarterly Update.

This release does not add additional scope or cost variables for incorporation into Operable Unit 7 and will be incorporated under existing work plans.

References

As enclosed:

RCRA Contingency Plan Implementation Report No. 92-021

PAC REFERENCE NUMBER: 100-613

IHSS Number: Not Applicable

Unit Name: Asphalt Surface in Lay Down Yard North of Building 130

Approx. Location: N749,102; E2,080,495

Date(s) of Operation or Occurrence

The spill occurred on Thursday, March 18, 1993, at 11:41 a.m.

Description of Operation or Occurrence

A total of three used, lead-acid batteries fell from a pallet while being transported from a weigh scale on the north side of Building 130 to a multi-purpose receiving and storage yard on the south side of Building 130. The batteries were being stored for recycling. The first battery fell when the forklift hit a bump. The forklift driver could not see the fallen battery and drove over it, resulting in another jolt from which two more batteries fell off the pallet. The first battery was crushed and the other two were overturned, resulting in a 2'x15' spill of sulfuric acid on the asphalt and sulfuric acid on the forklift's front wheels and forks.

Physical/Chemical Description of Constituents Released

The spill was characterized as approximately 2 to 4 quarts of sulfuric acid and lead based on previous analysis of the same type of batteries. These analyses identified lead concentrations in the acid at up to 20 ppm.

Responses to Operation or Occurrence

The Building 130 warehouse manager, the Shift Superintendent and the Fire Department were notified immediately. The forklift operators (who were wearing personal protective equipment) restored the fallen batteries to an upright position. The Fire Department Hazardous Materials (Hazmat) team arrived at the scene by 11:47 a.m. The area was roped off and all personnel near the incident and within 300 feet upwind were evacuated. Readings of the spill were done for pH which was found to be at a level of zero. Approximately five gallons of sodium bicarbonate was placed on the spill as well as on the forklift's front wheels and forks. The waste materials from the crushed battery were picked up, double-bagged and placed into a five-gallon Department of Transportation-approved drum which was stored in a RCRA 90-day accumulation area. The two damaged batteries were placed into a 20-gallon "lab pack" and returned to the pallet. The Hazmat equipment was decontaminated to a pH of 7 with water. This water was pumped to drums to await treatment in Building 374.

Fate of Constituents Released to Environment

Sodium bicarbonate was used to neutralize the acid and pick up the spilled solution. The resulting spoils were handled as a hazardous waste and placed in a 90-day accumulation area.

Comments

The Property Utilization and Disposal department, which was involved in the incident, will review the wrapping and packaging of batteries to see if a more secure method is available. The department is also writing a desk reference procedure to outline precautions for transporting batteries. The description of this release is submitted in accordance with the IAG, Sections I.B.3 Notification and I.B.5 Historical Release Report for final notification.

This PAC was formerly identified as PAC 000-501 in the Fourth Quarterly Update. It has been renumbered to better reflect its location on the PAC map.

References

RCRA Contingency Plan Implementation Report No. 93-003.

IHSS Number: Not Applicable

Unit Name: Hillside spill North of Solar Evaporation
Pond 207B North

Approx. Location: N751,000; E2,085,000

Date(s) of Operation or Occurrence

November 30, 1992

Description of Operation or Occurrence

A release of approximately 490 gallons of interceptor trench water was reported at 1:45 am on November 30, 1992. Surface water runoff and potentially contaminated groundwater are collected in the Interceptor Trench Pump House (ITPH) system prior to being pumped from a centralized sump into the 207B North Solar Evaporation Pond. The release originated from a separation of a pipe coupling in the 3" transfer line on the east slope of the 207B North Solar Evaporation Pond berm and flowed onto the surrounding soil.

The 3 ft. section of drain hose that was connected to the end of the inlet pipe to the 207B North Pond had frozen during several days of sub zero weather and caused a back pressure in the pipe when the interceptor central sump began to pump water into the pond.

Physical/Chemical Description of Constituents Released

The interceptor trench water is managed as RCRA-regulated hazardous waste because the groundwater may contain RCRA-regulated hazardous constituents due to the possibility of releases from the Solar Evaporation Ponds. Previous analytical testing indicate that listed hazardous waste constituents have been detected in the interceptor trench water. The material in the Solar Evaporation Ponds has been characterized as RCRA-regulated waste with the following EPA waste codes: D006, F001, F002, F003, F005, F006, F007, and F009. A sample of the water was taken on November 30, 1992 and preliminary results indicate that CLP volatiles are comparable to analytical results taken previously for this waste stream (Table 1). Upon validation of analytical results, all data will be forwarded to the Colorado Dept. of Health (CDH).

Table 1

	Mean ug/l	Standard Deviation	Maximum Detected	Number Detects	Number samples
Cadmium	1.84*	0.81	7.50 U	0	24
Chromium	9.84	11.10	32.50	8	26
Lead	1.23	0.80	3.60	2	28
Mercury	0.15	0.13	0.63	4	27
Silver	3.93	2.56	11.10	2	22
Carbon Tetrachloride	2.58	1.85	11.00	1	25
Toluene	2.50*	0.00	5.00 U	0	25
Trichloroethene	3.02	1.20	7.00	2	26

Note: * Mean calculated using half the detection limit for concentrations at the detection limit

U Analyzed but not detected

Responses to Operation or Occurrence

CDH was notified on November 30, 1992 that the RCRA Contingency Plan had been implemented. The Environmental Protection Agency, Region VIII was notified by facsimile on December 1, 1992.

The pipe connection has been repaired and the system was placed back into service. The released material was not directly recoverable because it soaked into the soil. Due to the location of the release (upgradient of the ITPH system in an area previously identified to be possibly contaminated by past releases from the proximal Solar Evaporation Ponds), no action was taken to immediately recover the material.

Fate of Constituents Released to Environment

The area impacted by this release is submitted in accordance with the IAG, Sections I.B.3 Notification, and I.B.5 Historical Release Report for final disposition.

Comments

This PAC was formerly identified as PAC 000-502 in the Second Quarterly Update. Based upon further investigation, this PAC is more accurately located in the 900 area as shown on the PAC map in Folder B.

References

Resource Conservation and Recovery Act (RCRA) Contingency Plan Implementation Report (CPIR) No. 92-023. December 15, 1992.

4.0 UPDATED IHSS AND PAC MAPS

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 94-RF-04917)

Quarterly Update Historical Release Report (HRR)

January 1, 1994 through March 31, 1994

April 1994

Individual Hazardous Substance Sites by Operable Unit

April 19, 1994

CERCLA Administrative Record Document, SW-A-002622

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 94-RF-04917)

Quarterly Update Historical Release Report (HRR)

January 1, 1994 through March 31, 1994

April 1994

Potential Areas of Concern

April 28, 1994

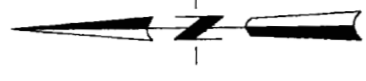
CERCLA Administrative Record Document, SW-A-002622

U.S. DEPARTMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

Potential Areas of Concern

- Paved roads
- Dirt roads
- Streams, ditches, and other drainage features
- Buildings and other structures
- Ponds and Lakes



Scale = 1 : 3000
1 inch = 250 feet

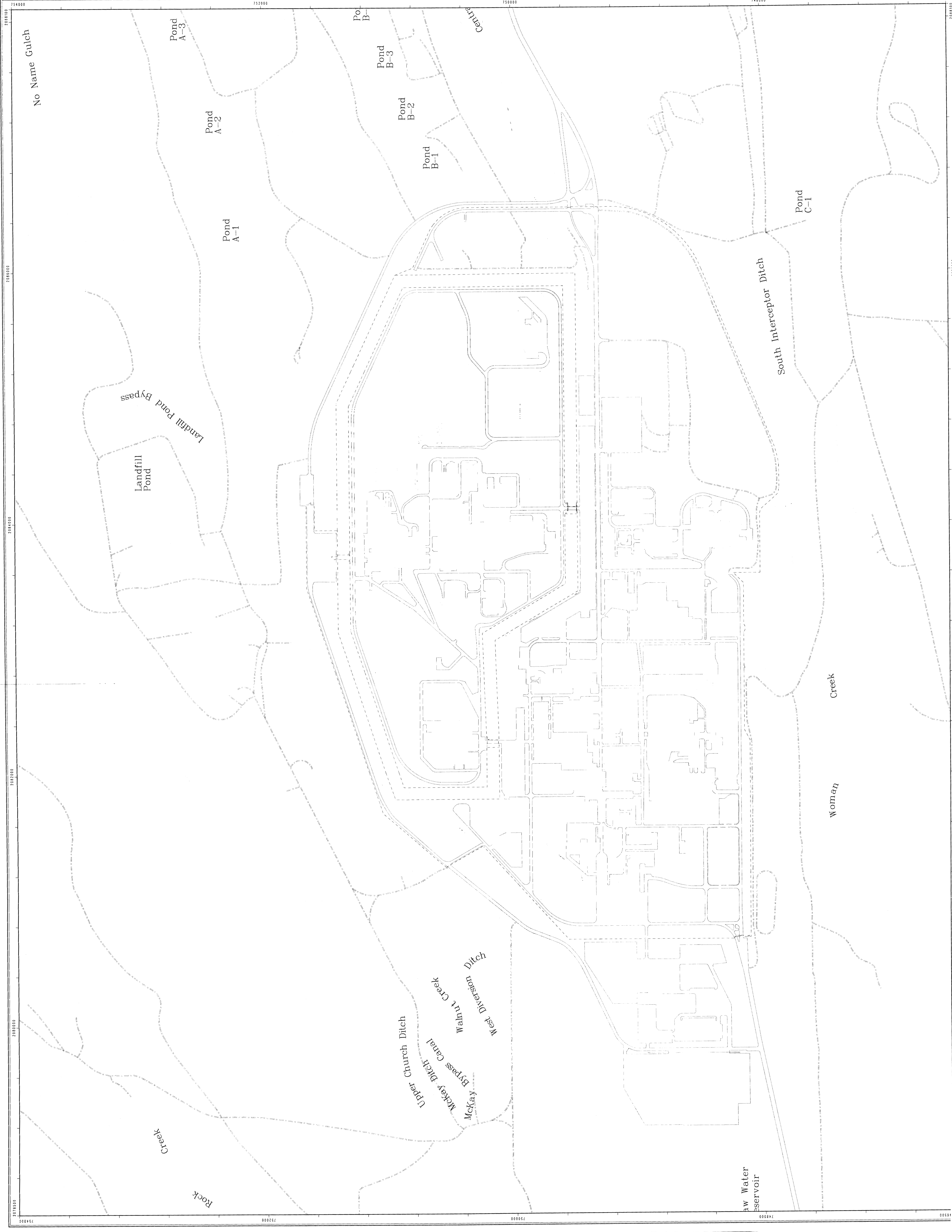


State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

Prepared by:



Rocky Flats Plant
P.O. Box 464
Golden, Colorado 80402-0464



Individual Hazardous
Substance Sites by
Operable Unit

- Paved roads
- Unimproved dirt roads
- Streams, ditches, and other drainage features
- Individual Hazardous Substance Sites
- Ponds/lakes
- Buildings or structures
- Operable Unit 1
- Operable Unit 2
- Operable Unit 4
- Operable Unit 5
- Operable Unit 6
- Operable Unit 7
- Operable Unit 8
- Operable Unit 9
- Operable Unit 10
- Operable Unit 11
- Operable Unit 12
- Operable Unit 13
- Operable Unit 14
- Operable Unit 15
- Operable Unit 16

Scale = 1 : 7200
1 inch = 600 feet



State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

Prepared by:

EG&G ROCKY FLATS

Rocky Flats Plant
P.O. Box 464
Golden, Colorado 80402-0464

Date: April 19, 1984

